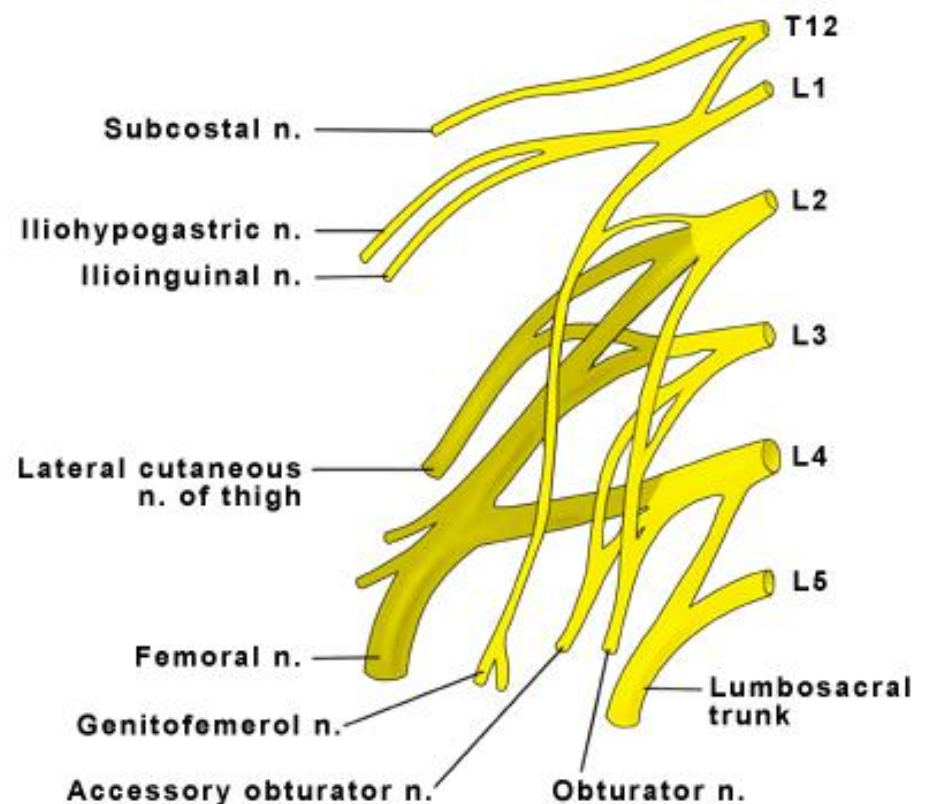


Lumbosacral Plexus

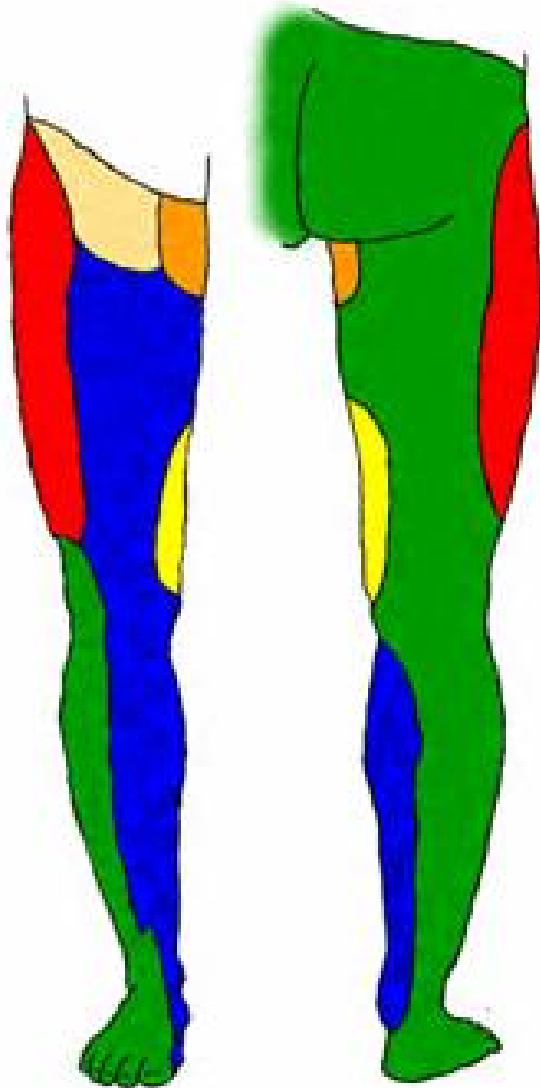
Lumbar Plexus

- formed from the ventral rami of nerves L1-L4 and some fibers from T12, forming
 - iliohypogastric nerves
 - ilioinguinal nerve
 - genitofemoral nerve
 - lateral femoral cutaneous nerve
 - femoral nerve
 - saphenous nerve
 - obturator nerve









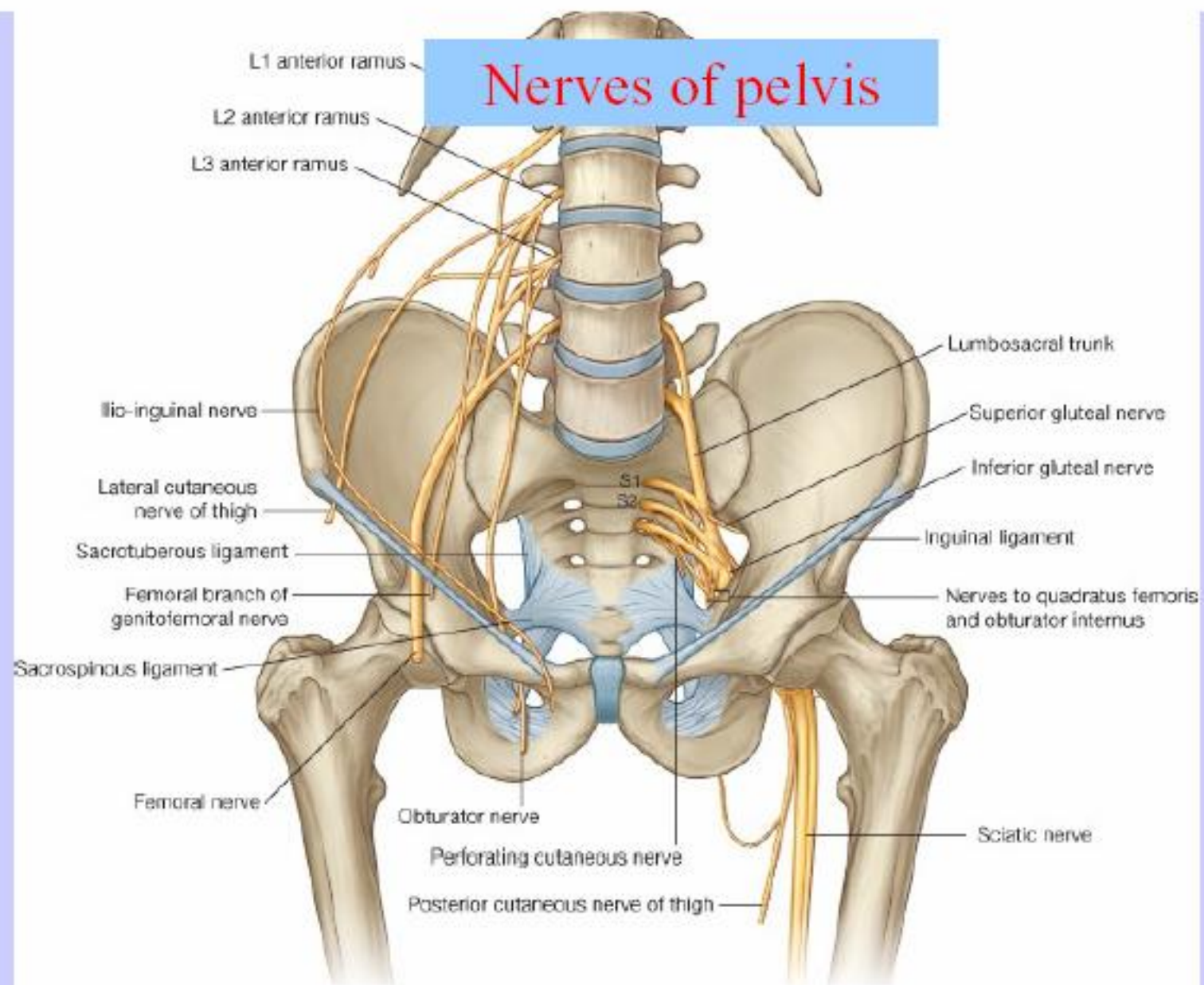
[next slide](#)

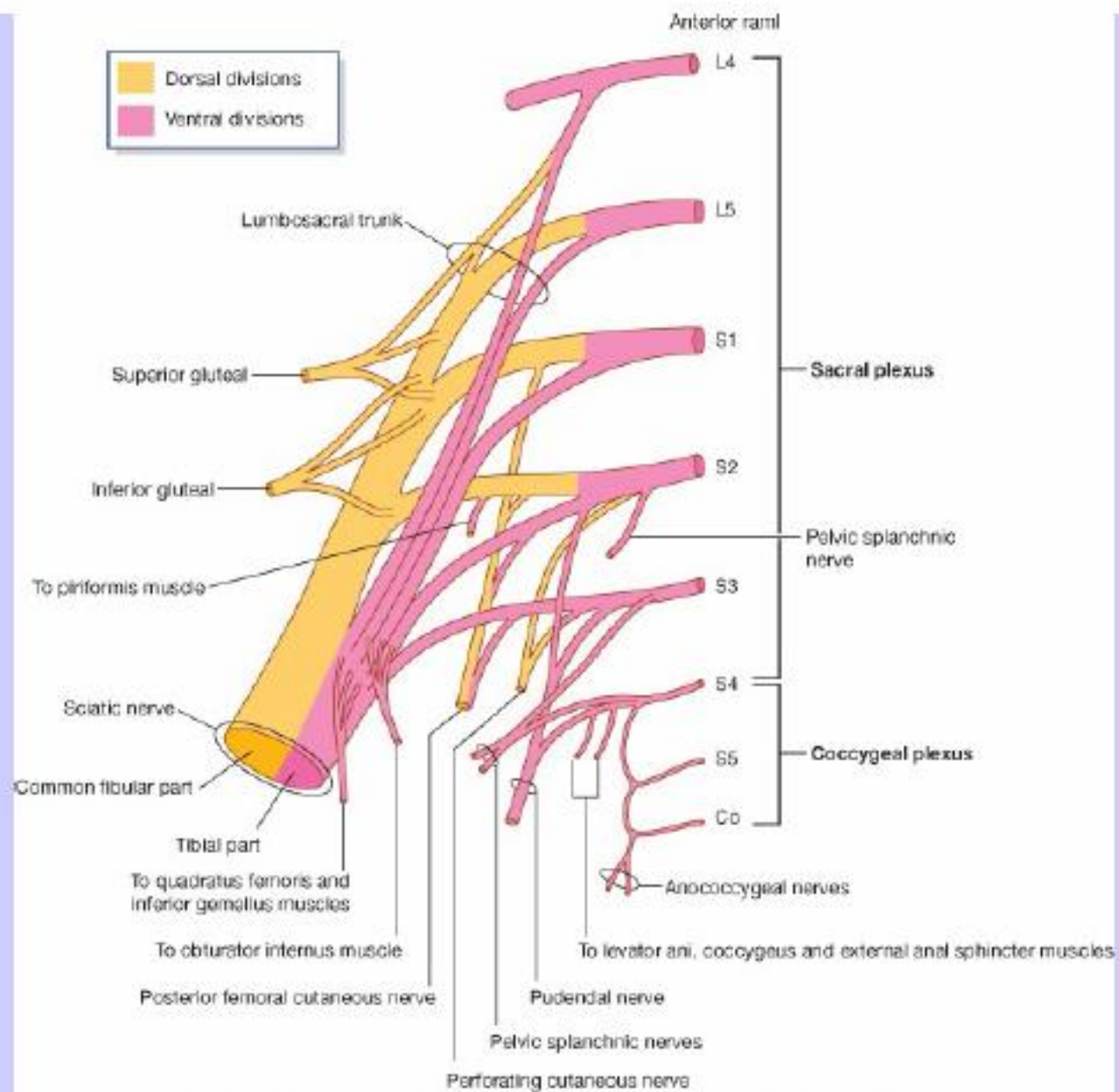
Cutaneous Innervation of Lumbar Plexus



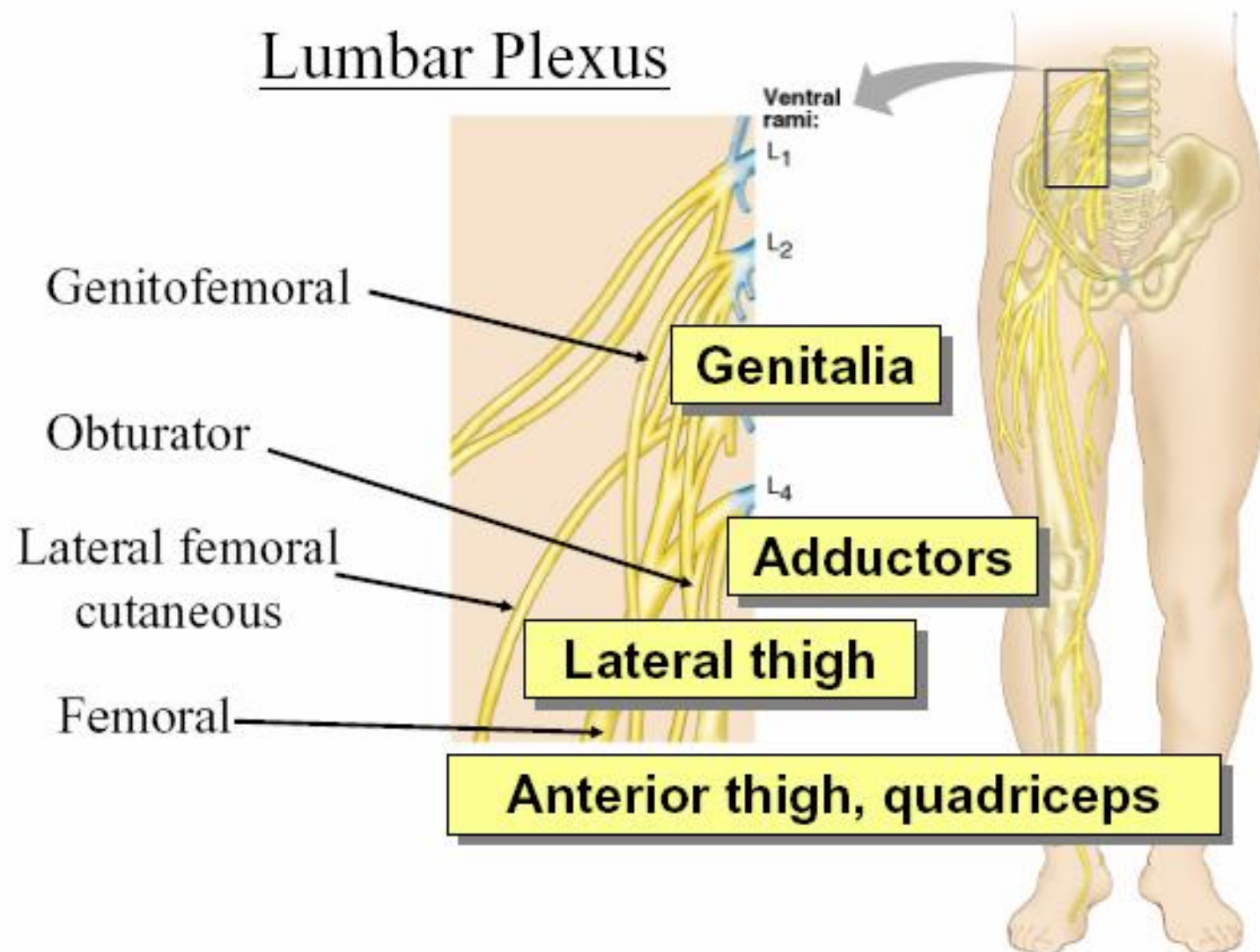
Innervation of Lumbar Plexus

- Genitofemoral nerve, 
- Iliohypogastric and ilioinguinal nerves, 

- Femoral nerve, 
- Lateral cutaneous nerve of the thigh, 
- Obturator nerve 
- Sciatic Nerve

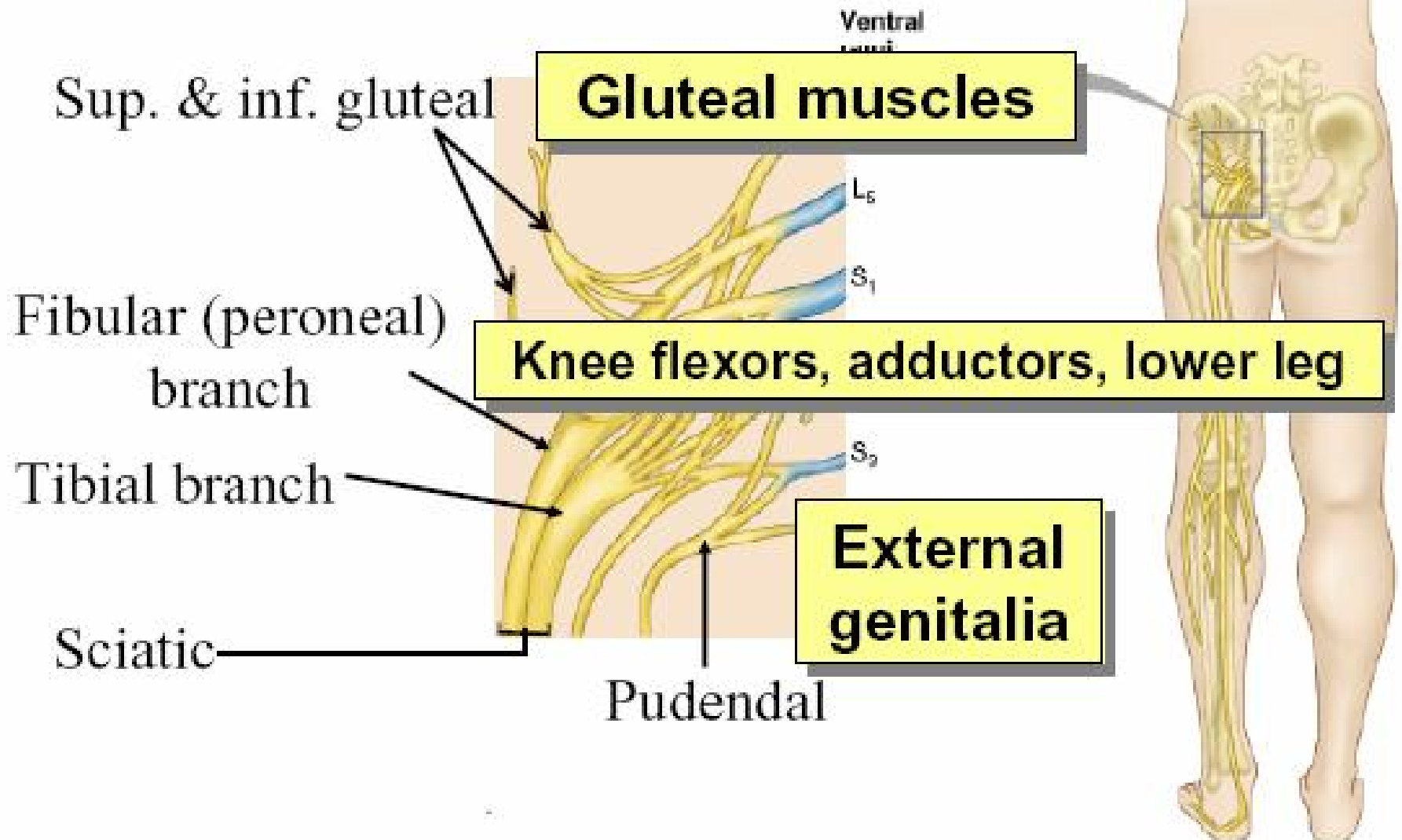




Lumbar Plexus




Sacral Plexus




<u>Nerve</u>	<u>Origin</u>	<u>Distribution</u>
Lat. femoral cutaneous	L2,3	sensory: lateral side of thigh
femoral	L2,3,4	motor: muscles on anterior side of thigh sensory: anterior side of thigh; medial half of lower leg
obturator	L2,3,4	motor: adductors of thigh and knee sensory: proximal medial part of thigh
Sup. gluteal	L4,5; S1	motor: gluteus med., gluteus min., tensor fasciae latae
Inf. gluteal	L5; S1,2	motor: gluteus maximus
Post. femoral cutaneous	S1,2,3	sensory: posterior side of thigh
pudendal	S2,3,4	sensory: genitalia, perineum, anus

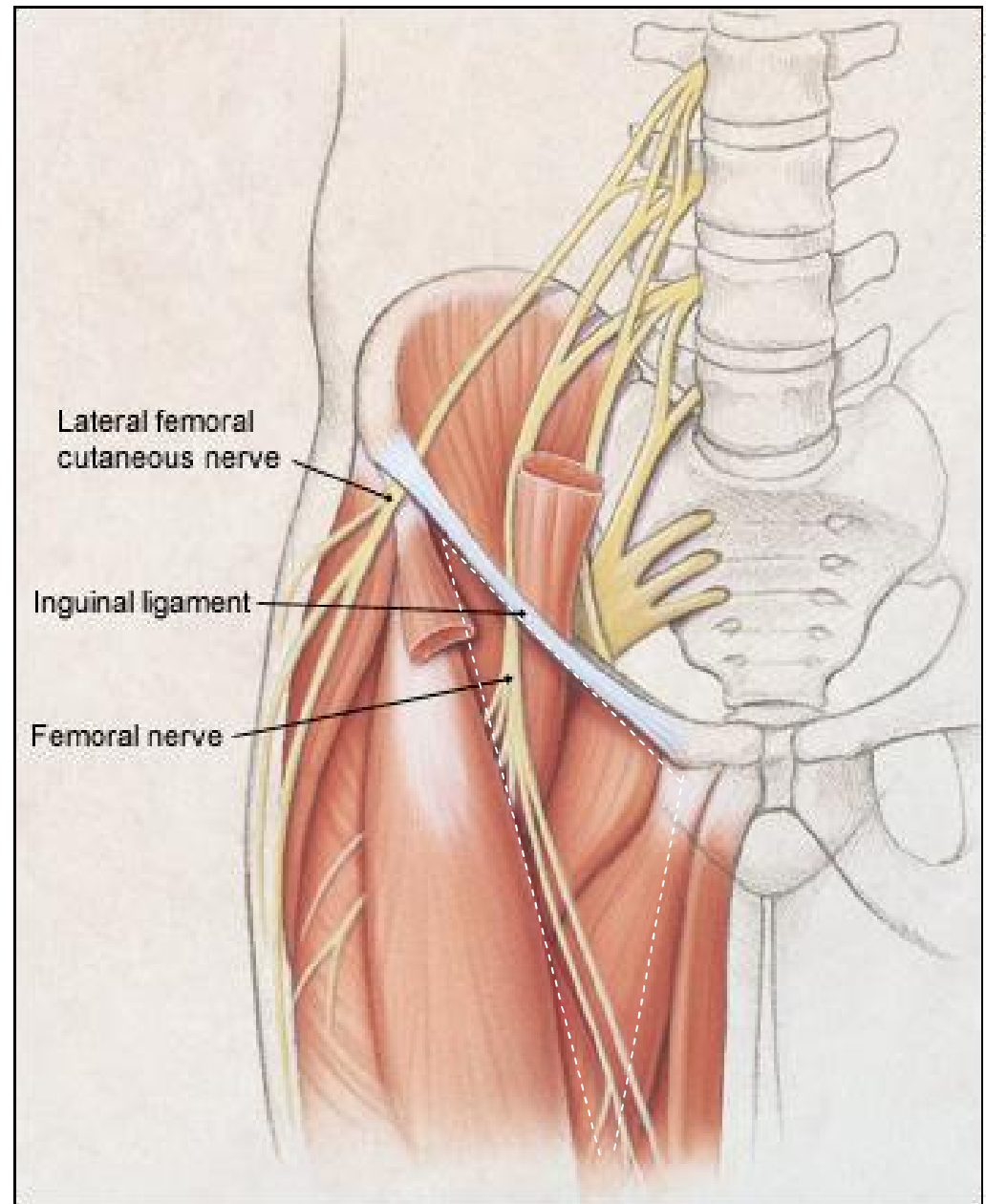
Sciatic	L4,5;	
	S1,2,3 tibial branch	motor: see superficial and deep branches sensory: proximal lateral part of lower leg; see superficial and deep branches
	common peroneal	motor: hamstrings; posterior compartment of lower leg sensory: distal posterior part of lower leg
	Sup. peroneal	motor: lateral compartment of lower leg sensory: distal anterior part of lower leg
	deep peroneal	motor: anterior compartment of lower leg sensory: part of dorsal side of foot

Lateral Femoral Cutaneous Nerve

lateral femoral cutaneous nerve- somatosensory only to skin of lateral aspect of thigh. 

Femoral nerve

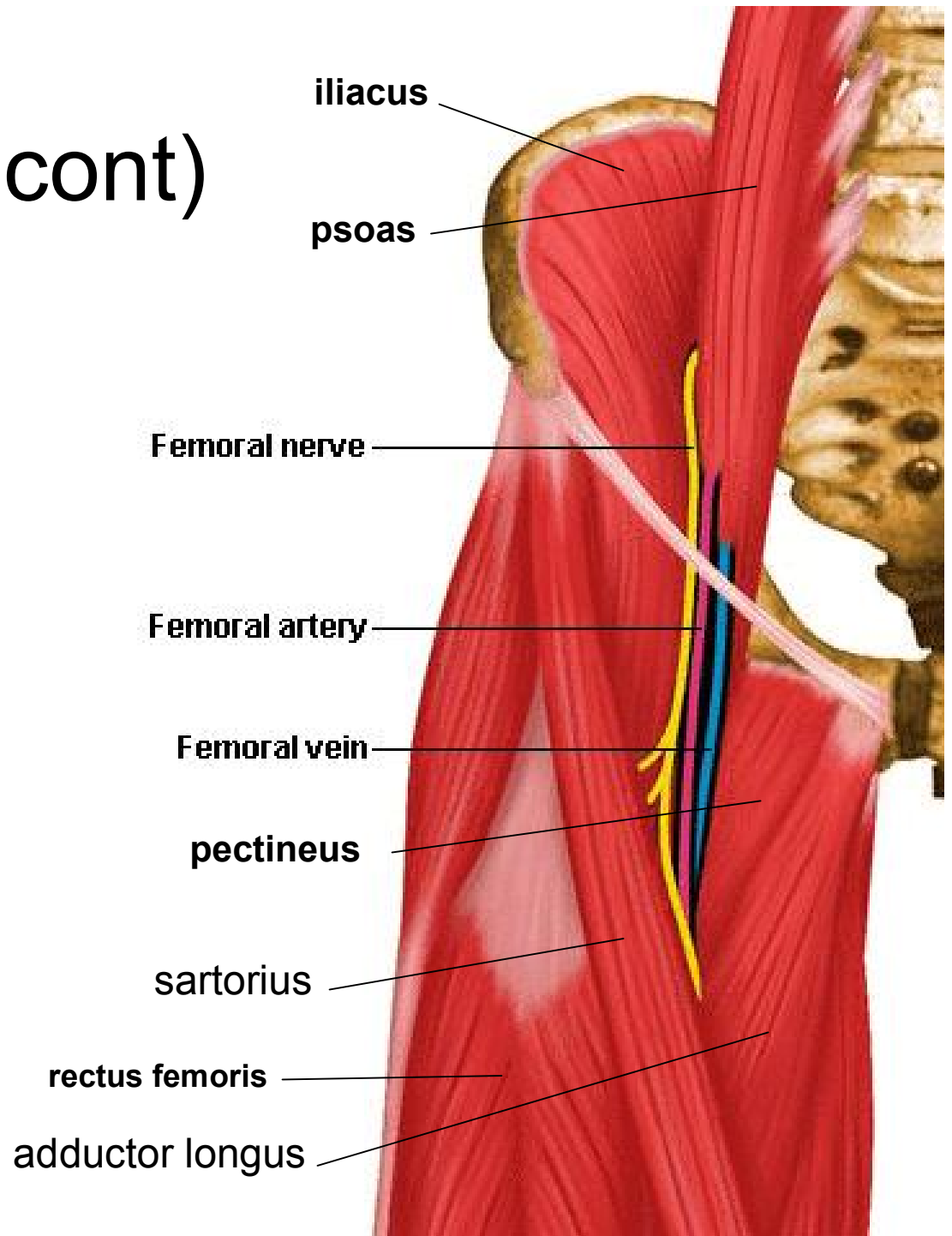
- largest branch of lumbar plexus
- motor and somatosensory
 - skin of anterior and lateral thigh, medial leg and foot 
 - anterior muscles of thigh and extensors of leg; **iliacus**, **psoas major**, **pectineus**, **quadriceps femoris** (rectus femoris, vastus intermedius, vastus lateralis and vastus medialis), and **sartorius**



Femoral Nerve (cont)

It is in the femoral triangle where the femoral nerve, overlying the iliacus muscle, that the nerve divides into its muscular and sensory branches.

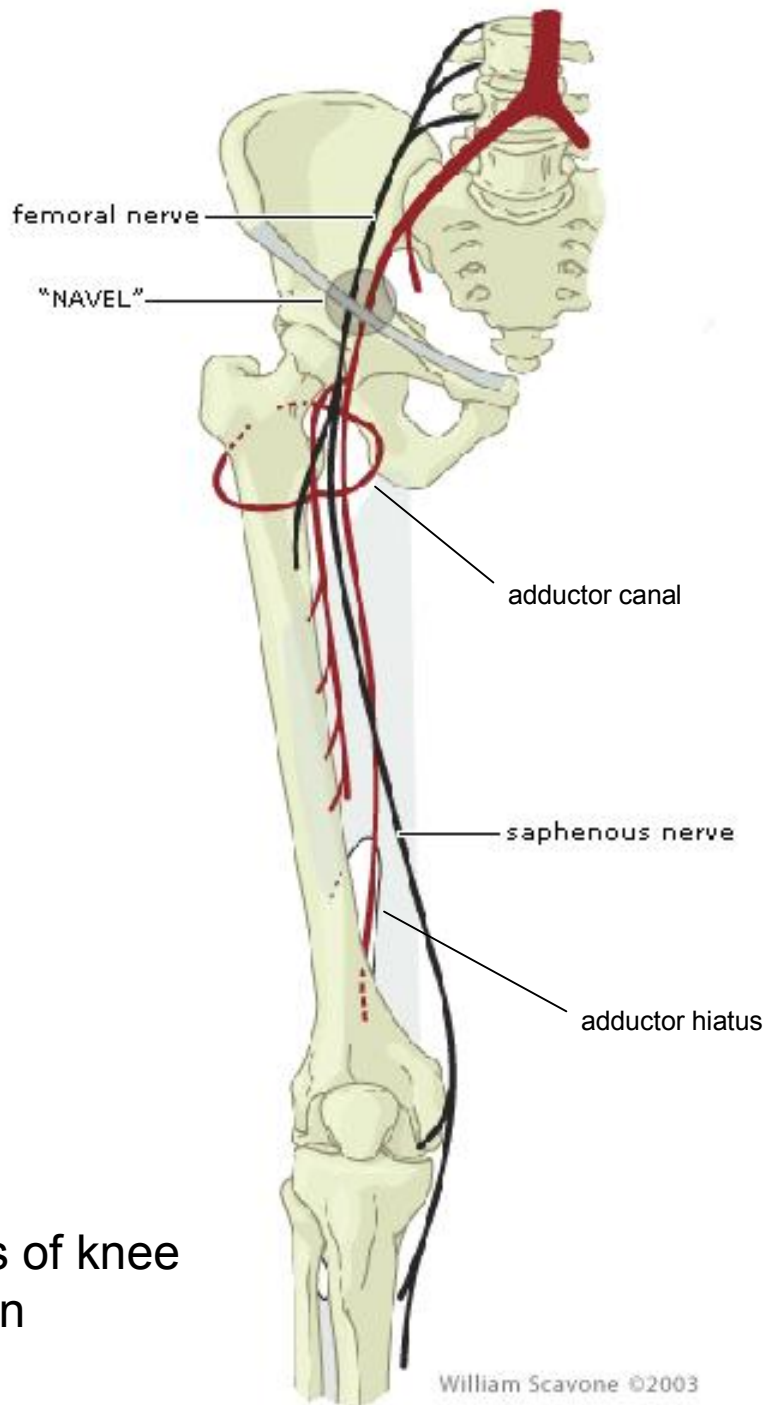
Only the **saphenous nerve** branch enters the **adductor canal**, along with a branch to the vastus medialis muscle.

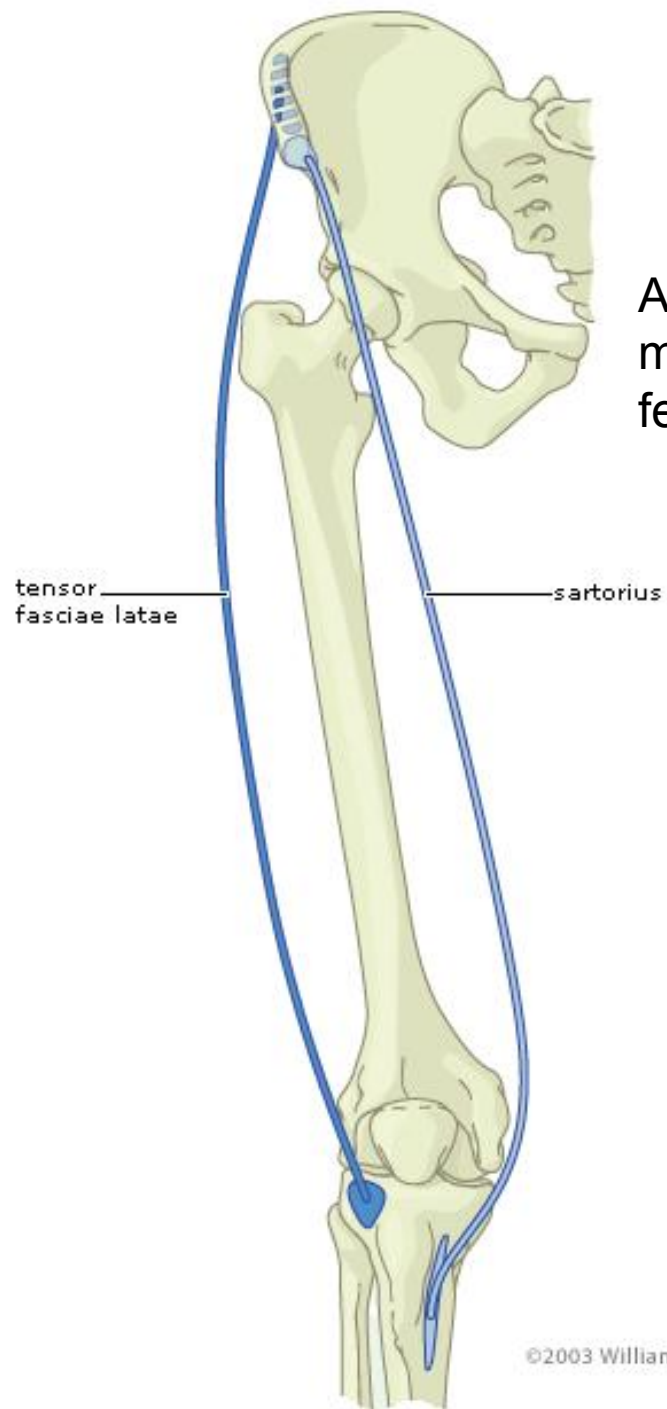


Femoral Nerve Innervates **muscles of the Anterior Thigh**

**Action: Flex hip,
extend knee**

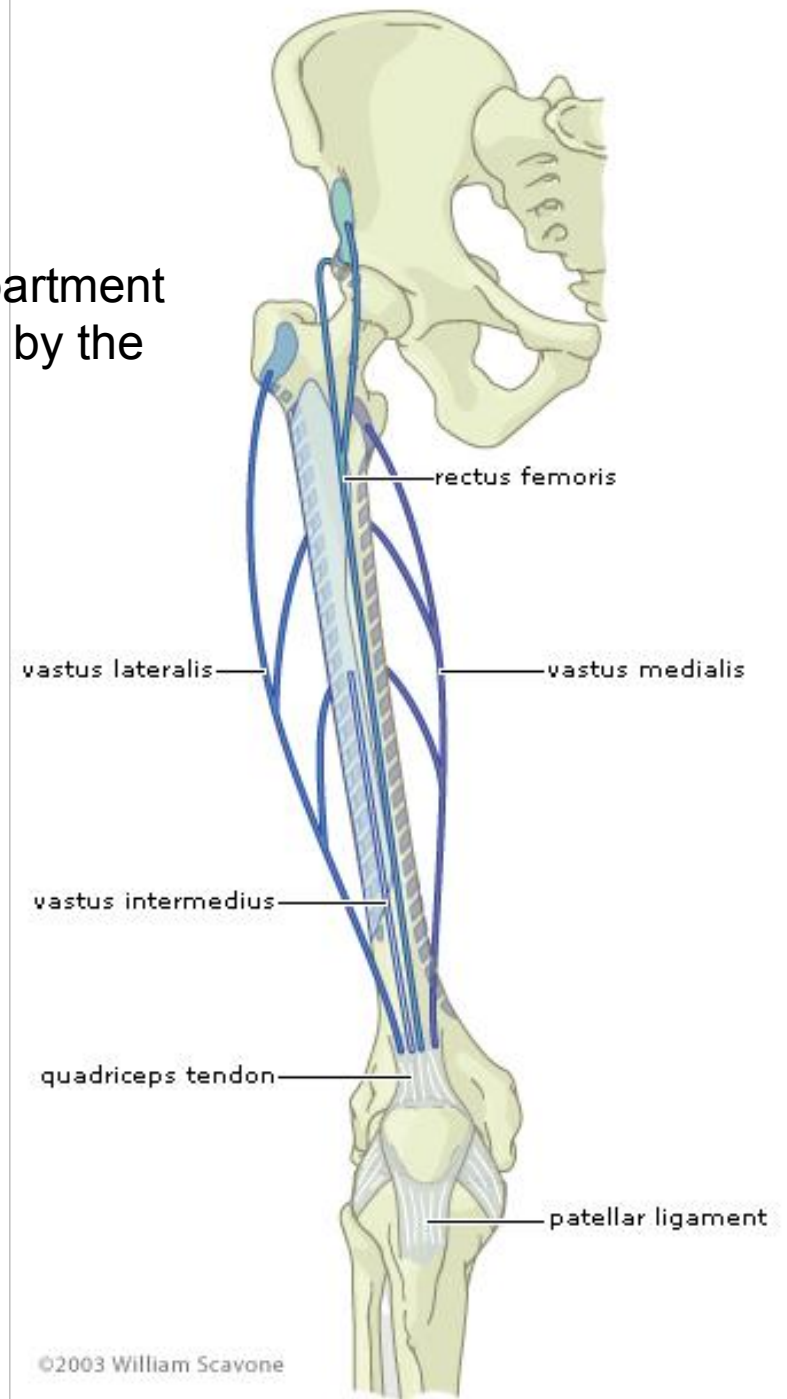
Injury to nerve: Weakness of hip flexion, loss of knee extension (no patellar reflex), sensory loss on anteromedial thigh, knee, leg, and foot





Anterior thigh compartment
muscles innervated by the
femoral nerve

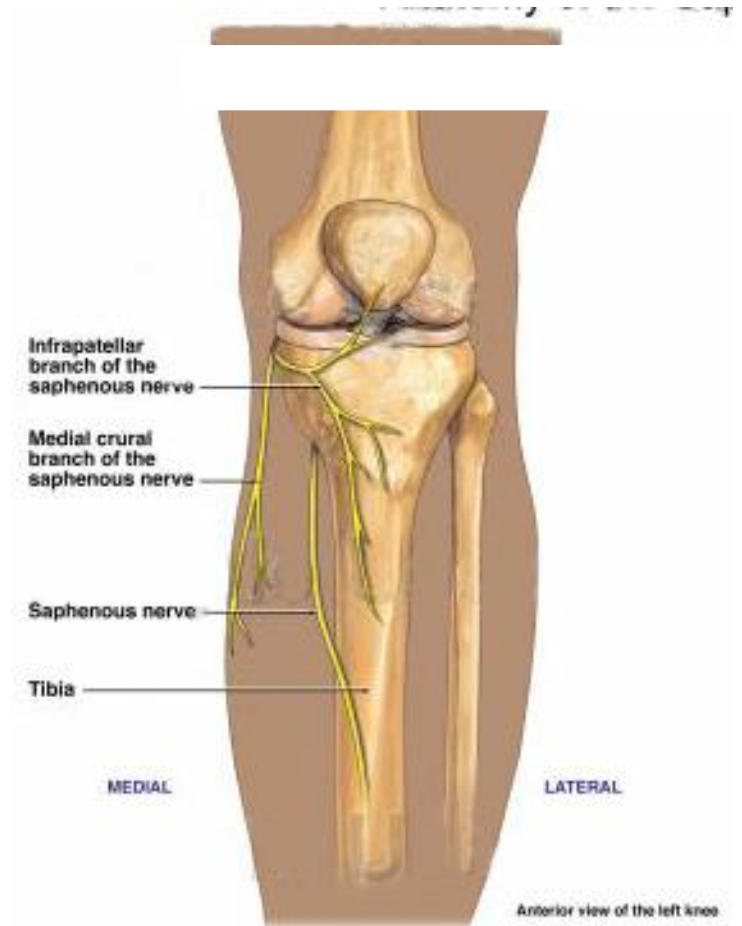
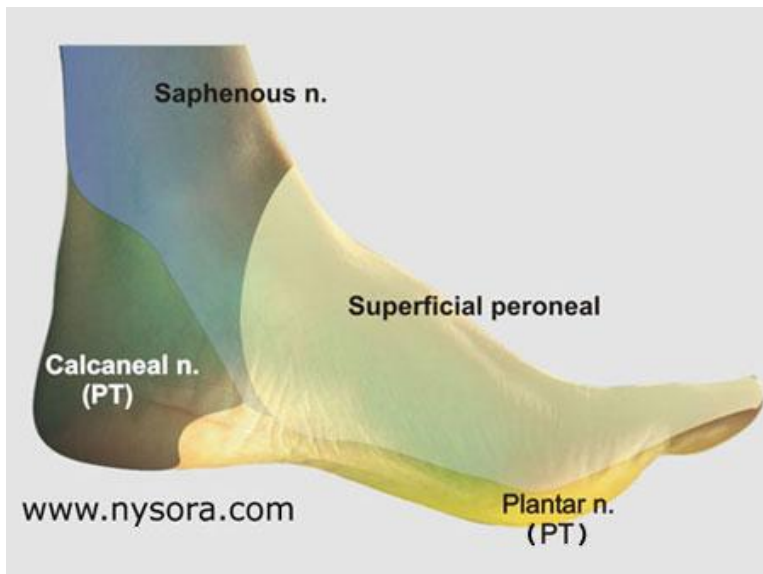
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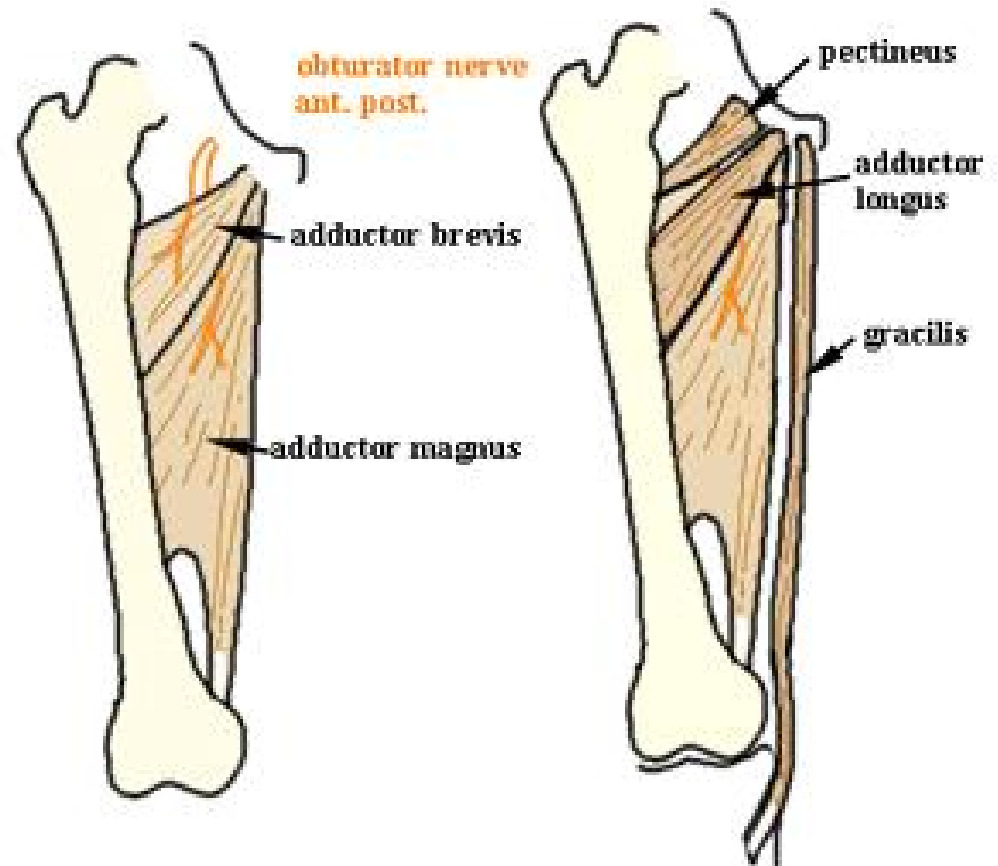
Saphenous Nerve

- formed from the posterior division of the femoral nerve
- is the largest cutaneous branch of the femoral nerve.
- innervates skin of medial aspects of leg and foot: knee joint




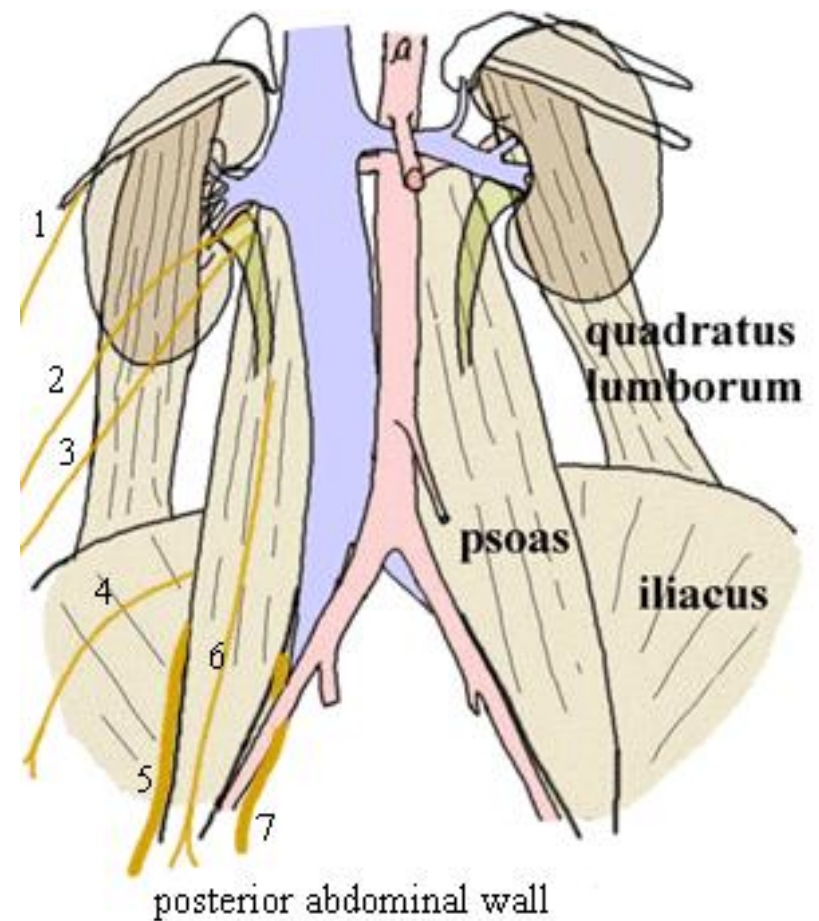
Obturator Nerve

- sensory innervations-
skin of superior
medial thigh 
- motor innervation-
adductor muscles of leg: external oblique,
pectineus, adductor
longus, adductor
brevis, adductor
magnus, and gracilis




iliohypogastric nerve

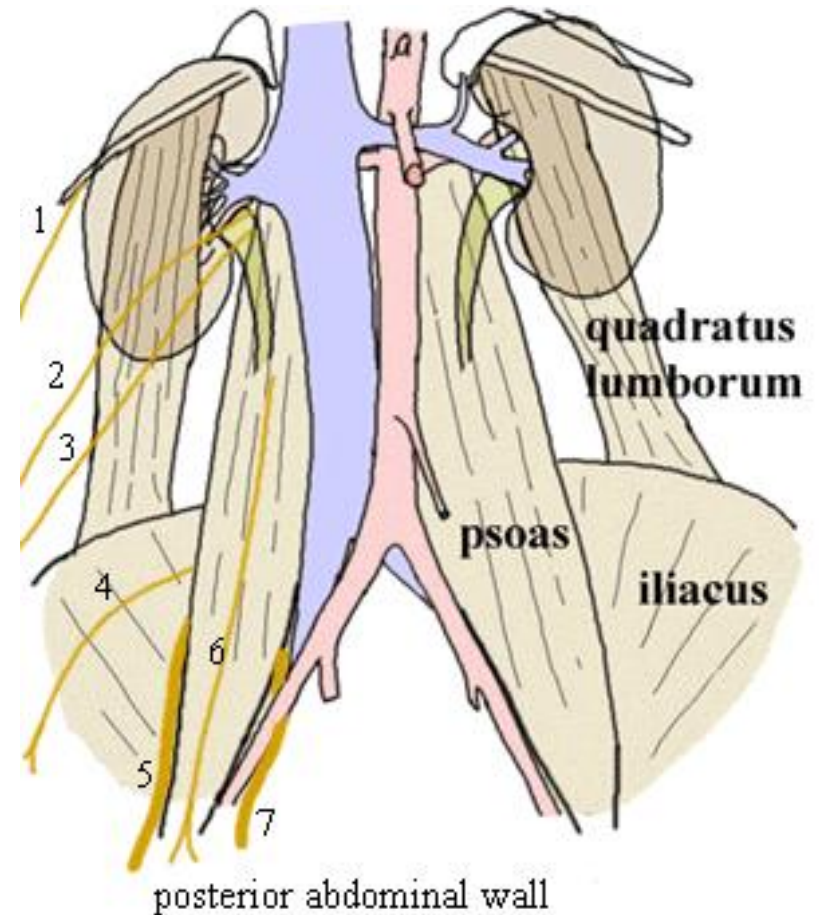
- formed by fibres **from L1**, with some contribution from T12.
- runs obliquely across the quadratus lumborum muscle behind the kidney
- sensory innervation- **skin of anterior abd wall** 
- Motor innervation- **internal and external obliques and transversus abdominis**



1. Subcostal nerve
2. Iliohypogastric nerve
3. Ilioinguinal nerve
4. Lateral cutaneous nerve of the thigh
5. Femoral nerve
6. Genitofemoral nerve
7. Obturator nerve


ilioinguinal nerve

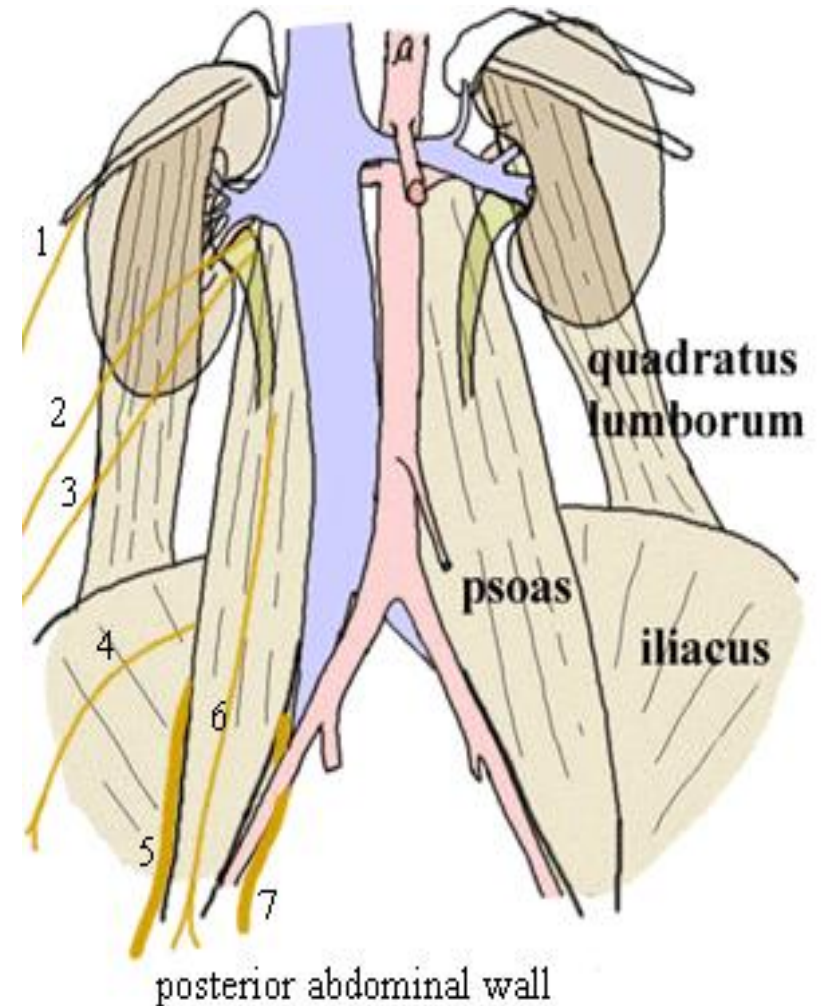
- formed in common with the iliohypogastric nerve.
- sensory innervation- skin of upper medial thigh; male scrotum and root of penis; female labia majora 
- motor innervation- joins iliohypogastric nerve and innervates the same muscles



1. Subcostal nerve
2. Iliohypogastric nerve
3. Ilioinguinal nerve
4. Lateral cutaneous nerve of the thigh
5. Femoral nerve
6. Genitofemoral nerve
7. Obturator nerve

Genitofemoral Nerve

- formed from L1,2 and passes through the psoas to emerge on its anterior surface.
- runs down wards on the psoas and divides into genital and femoral branches.
- sensory innervation- **skin** of middle anterior thigh; **male scrotum** and **cremaster muscle**; female labia majora 

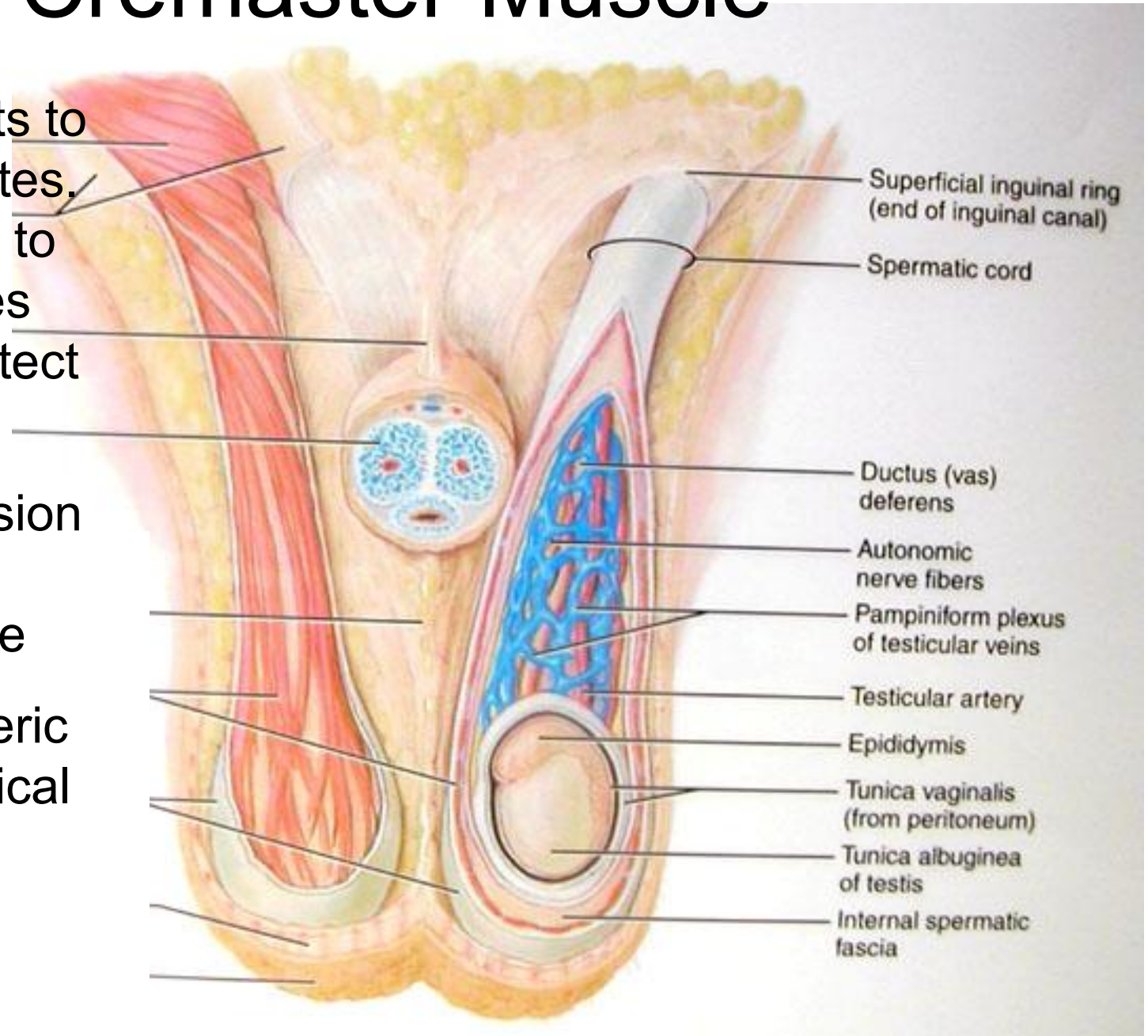


1. Subcostal nerve
2. Iliohypogastric nerve
3. Ilioinguinal nerve
4. Lateral cutaneous nerve of the thigh
5. Femoral nerve
6. Genitofemoral nerve
7. Obturator nerve

Cremaster Muscle

Cremaster acts to retract the testes. This functions to keep the testes warm and protect from injury.

- it is an extension of the internal oblique muscle
- The cremasteric reflex is a clinical test of the muscle.

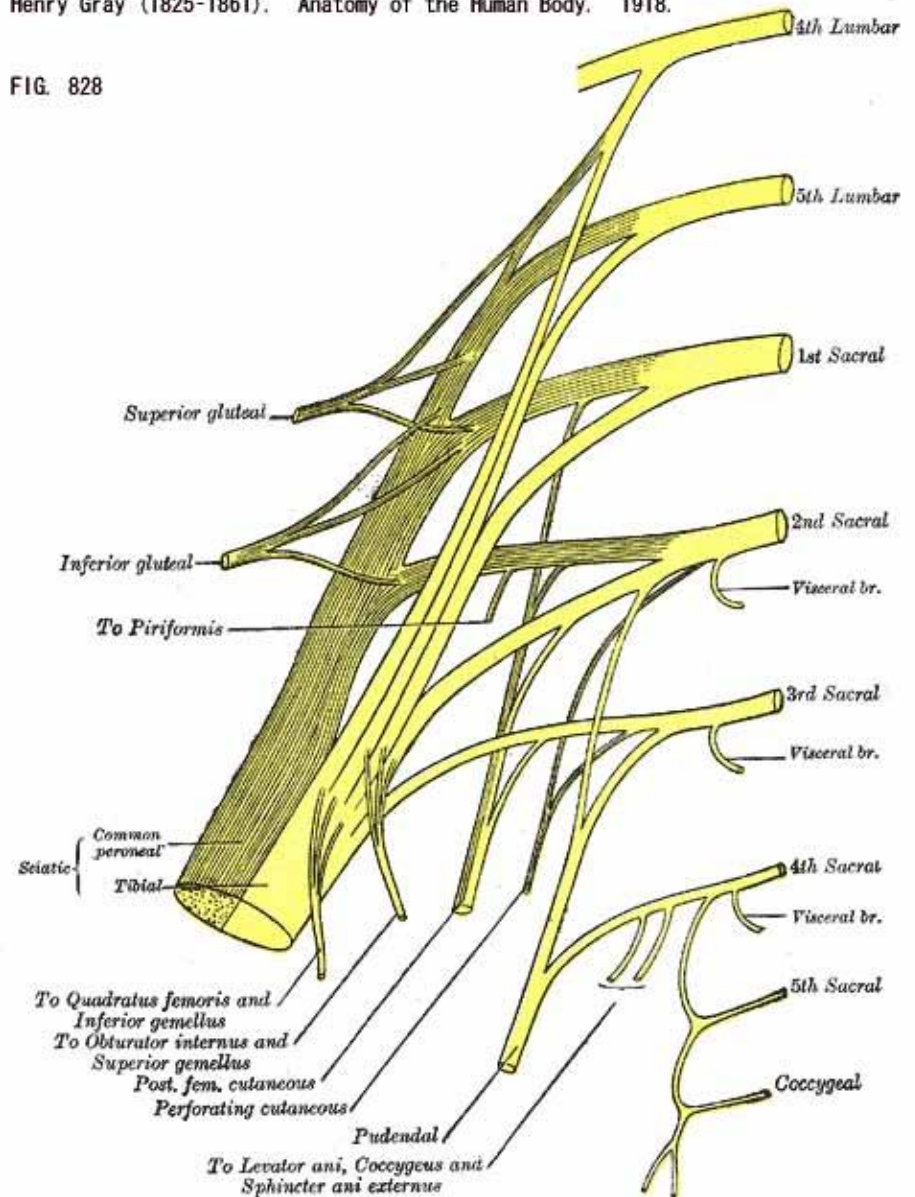


Sacral Plexus

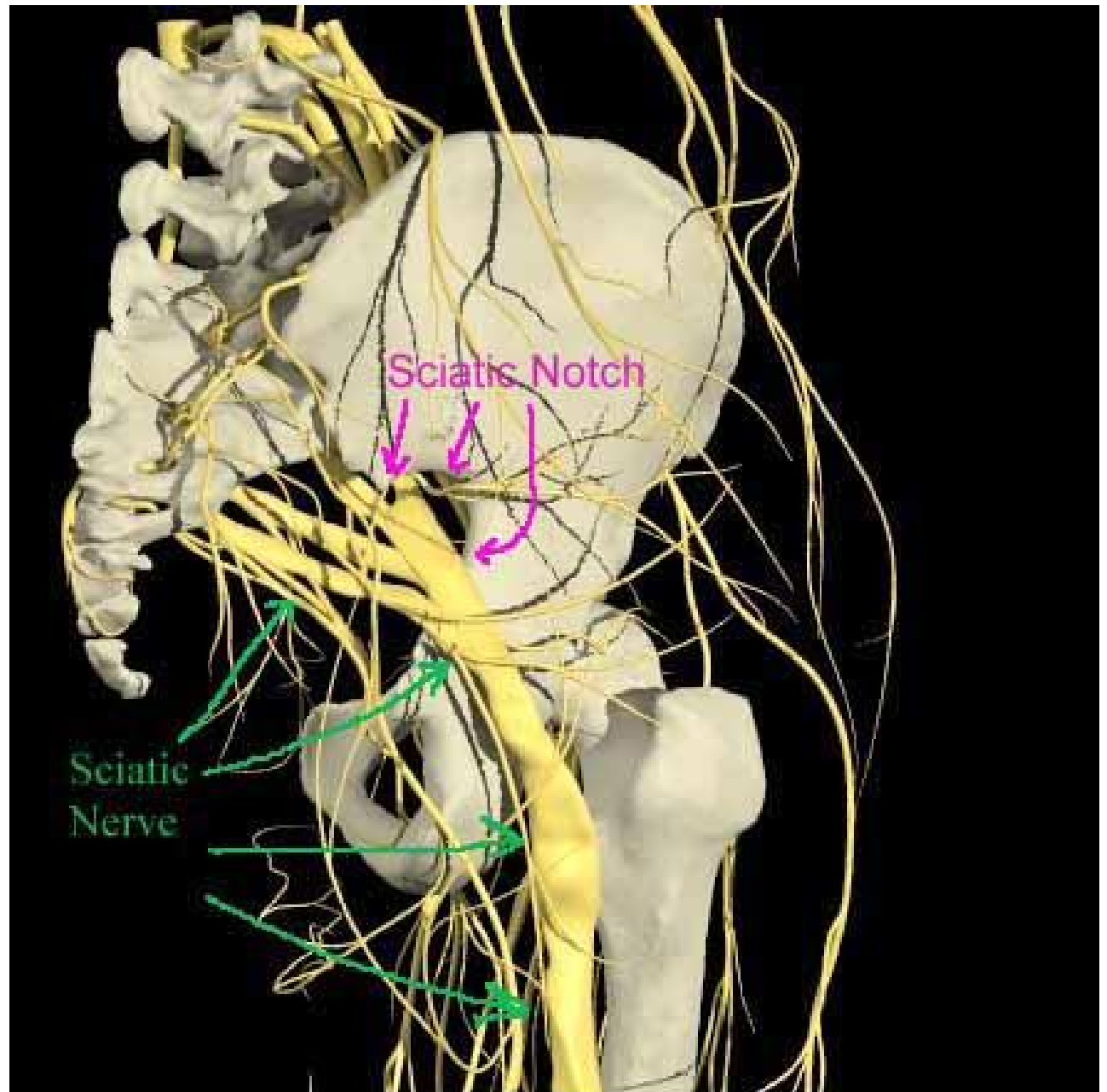
- Nerve roots from L4-S3 merge to form the sacral plexus

Henry Gray (1825-1861). *Anatomy of the Human Body*. 1918.

FIG. 828



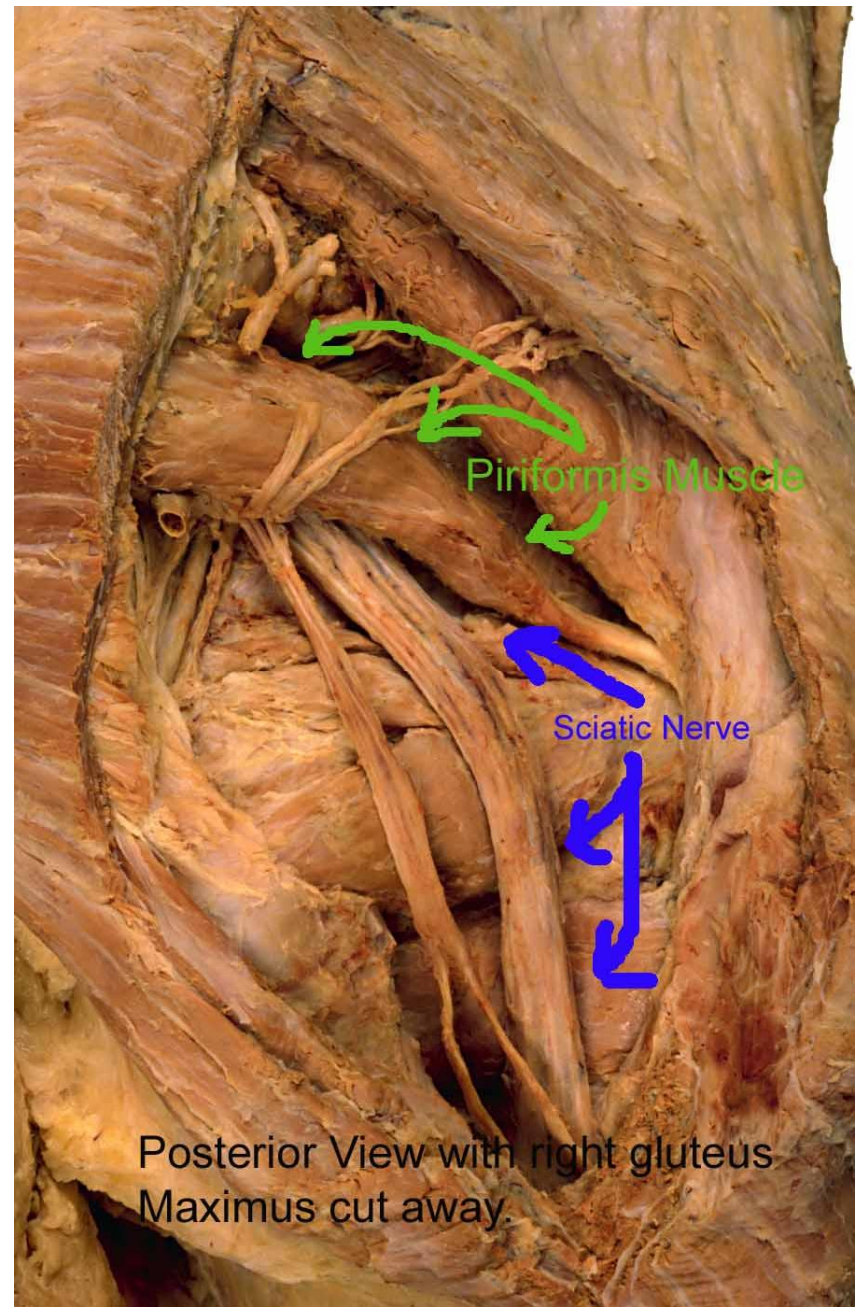
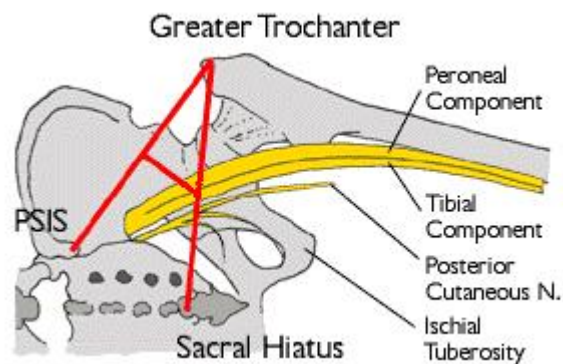
- After merging, the sacral plexus passes through a boney notch in the pelvis known as the **Greater Sciatic Notch** (Greater Sciatic Foramen).
- It is here that the sciatic nerve gets its name.



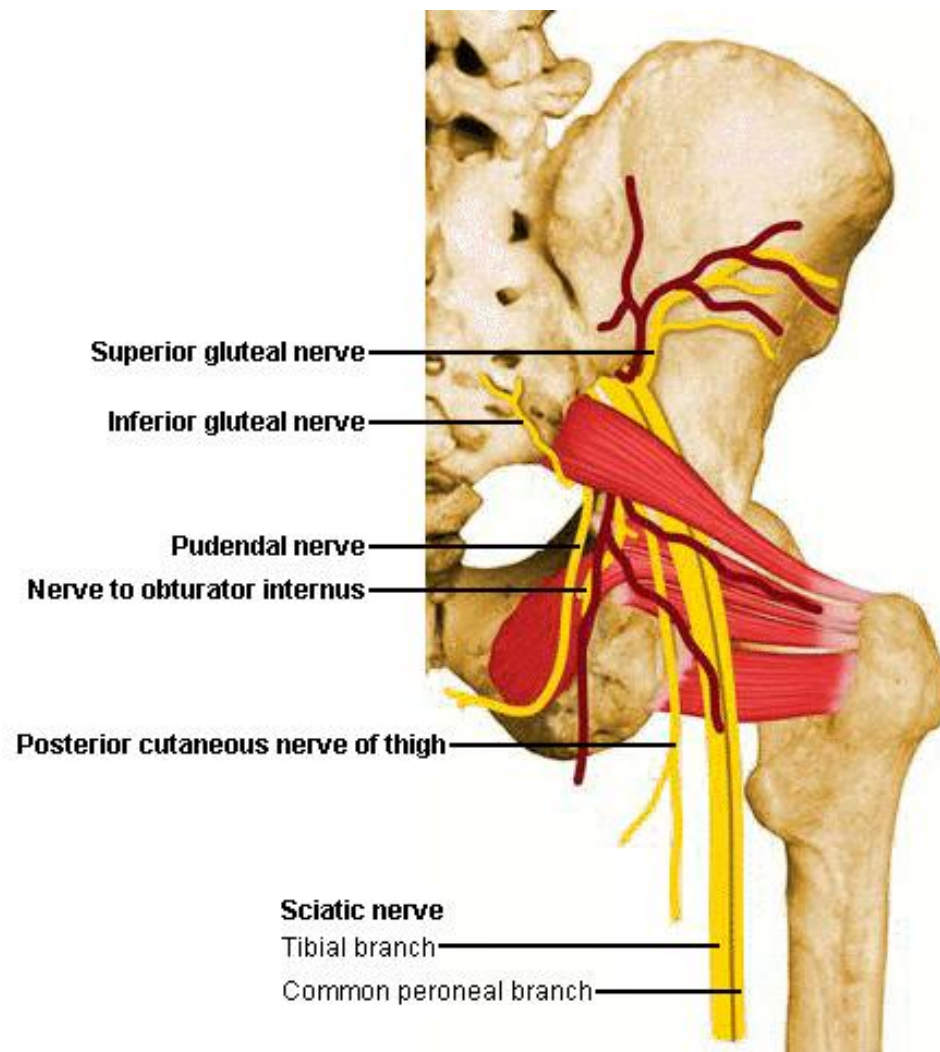
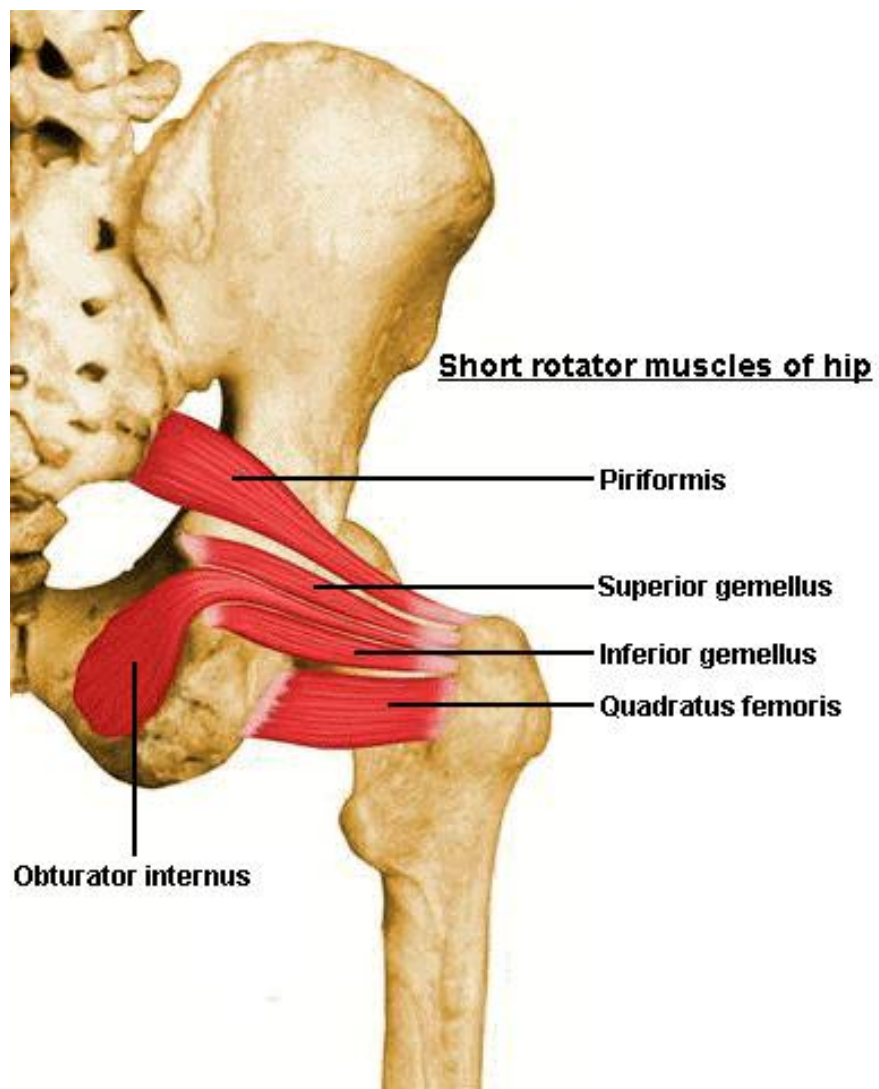
Next, it passes under or through a muscle called the Piriformis Muscle

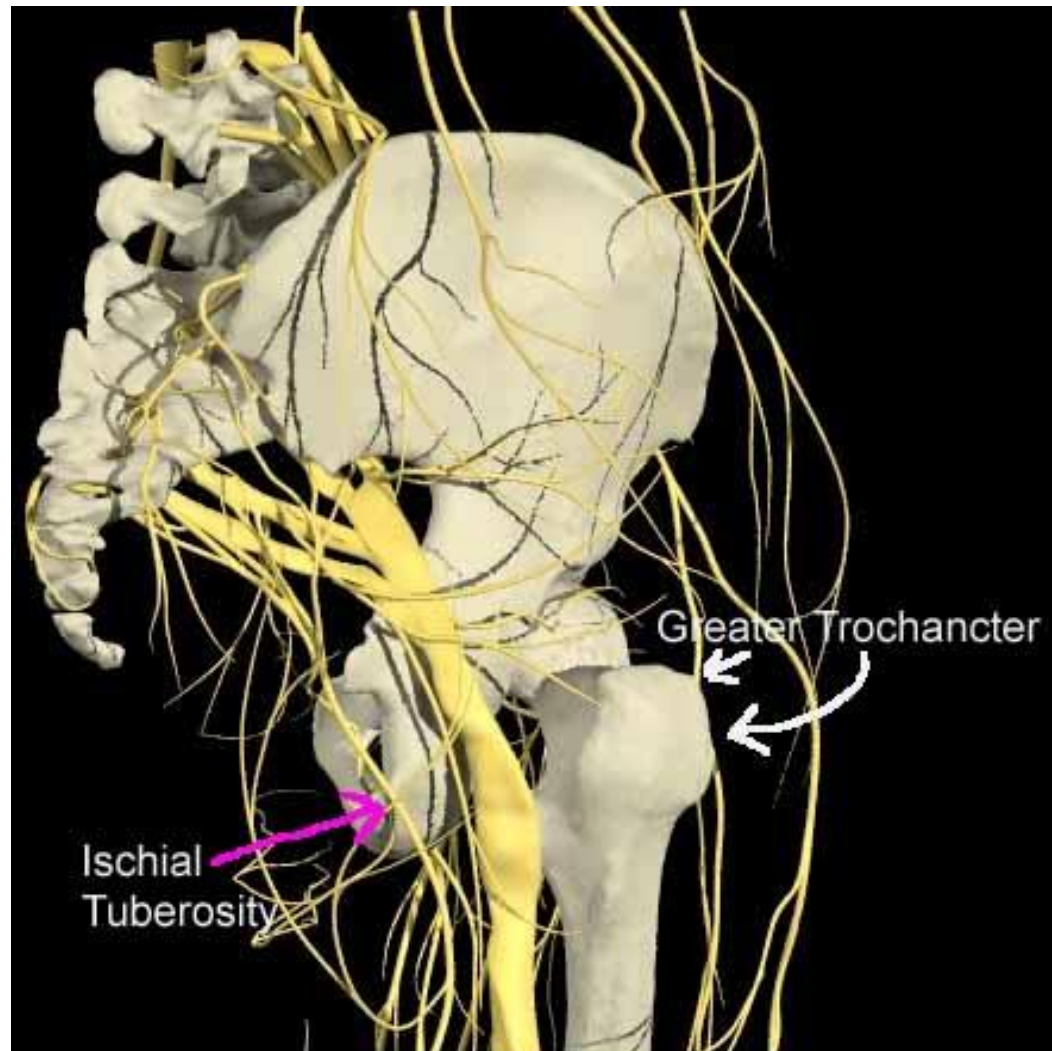
Here, it divides to form the

- **lateral common peroneal-** supplies fibres to the **short head of biceps femoris**.
- **medial tibial divisions-** supplies the **semimembranosus**, **semitendinosus**, the ischial head of **adductor magnus** and **long head of biceps femoris**



Posterior View with right gluteus Maximus cut away.



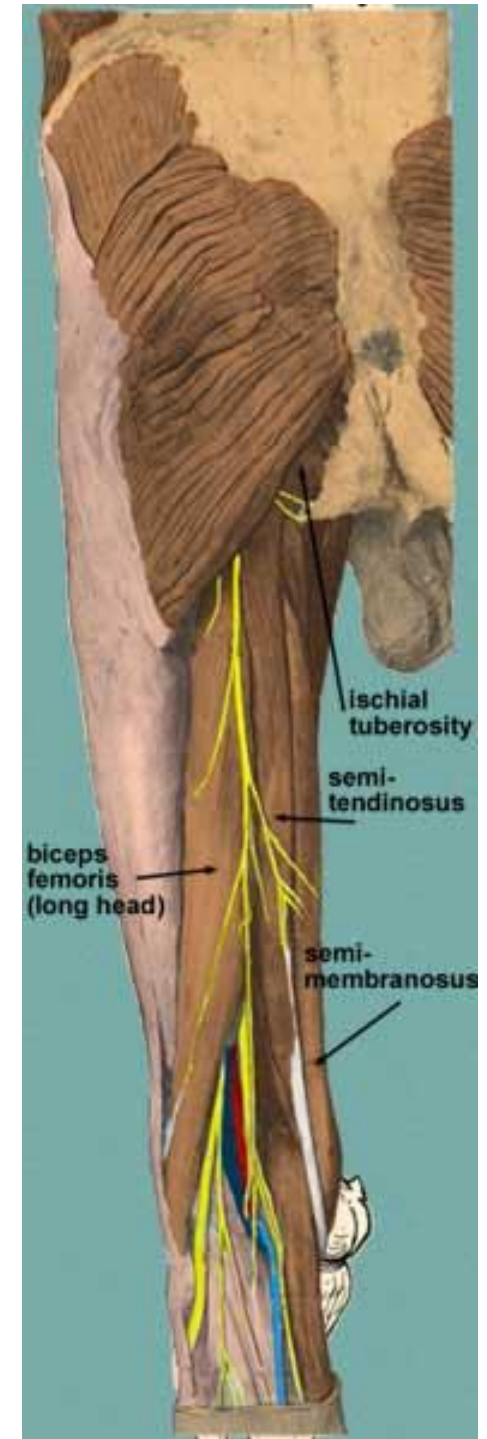


In the gluteal region the nerve lies deep to gluteus maximus, between the Greater Trochanter of the femur and the ischial tuberosity

The sciatic nerve then passes posterior to the adductor magnus and between the **hamstring muscles (posterior compartment muscles)**, where the tibial part innervates:

- semitendinosus
- semimembranosus
- biceps femoris (long head)

To be called a hamstring, the muscle must arise from the ischial tuberosity.

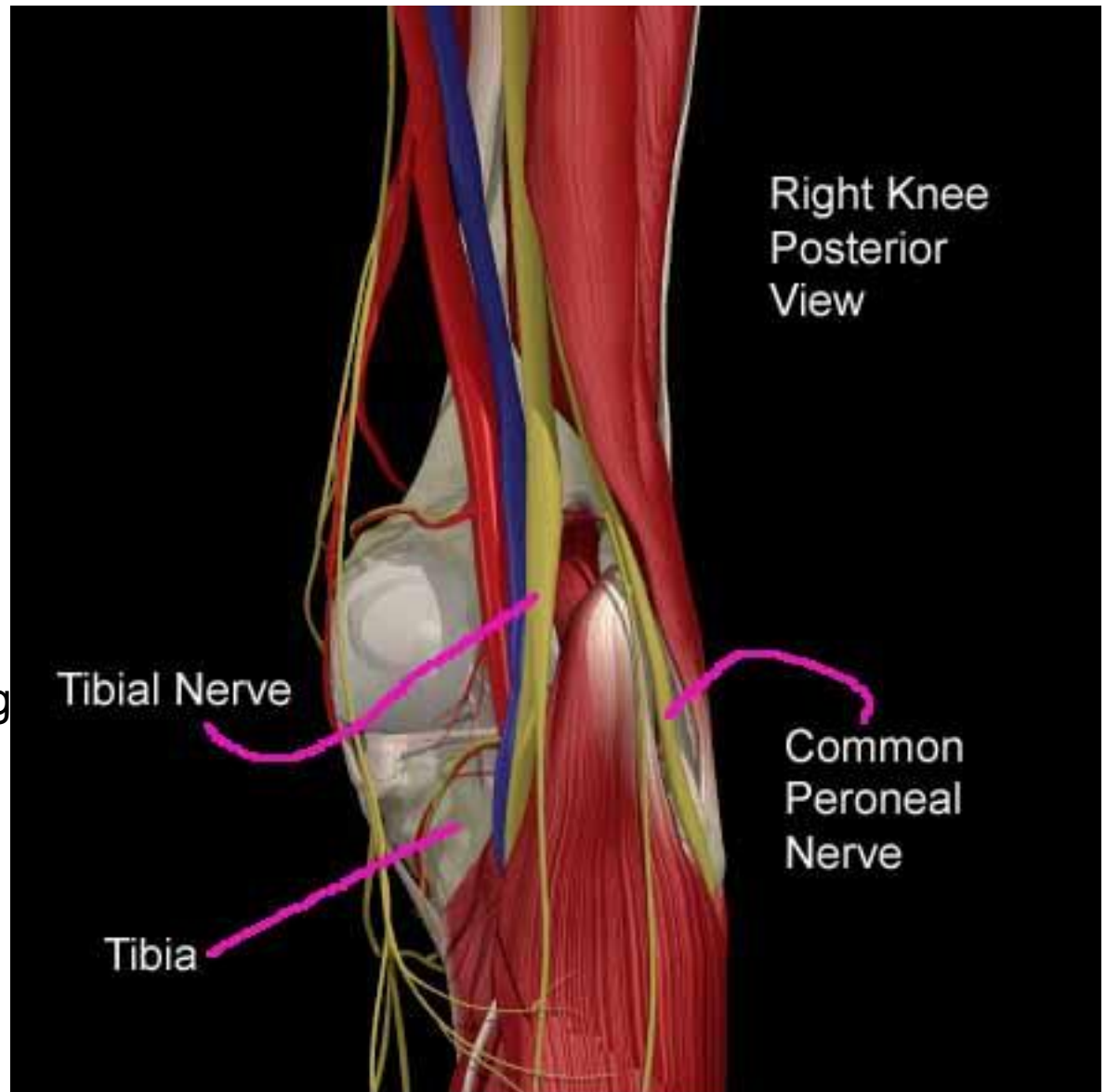


As the sciatic nerve reaches the posterior knee (popliteal fossa) it physically divides to form the

- **Tibial nerve**

- **Common Peroneal nerve.**

- The Tibial nerve gets its name because it follows the Tibial bone and Common Peroneal due to its soft tissue location at the outer leg region.

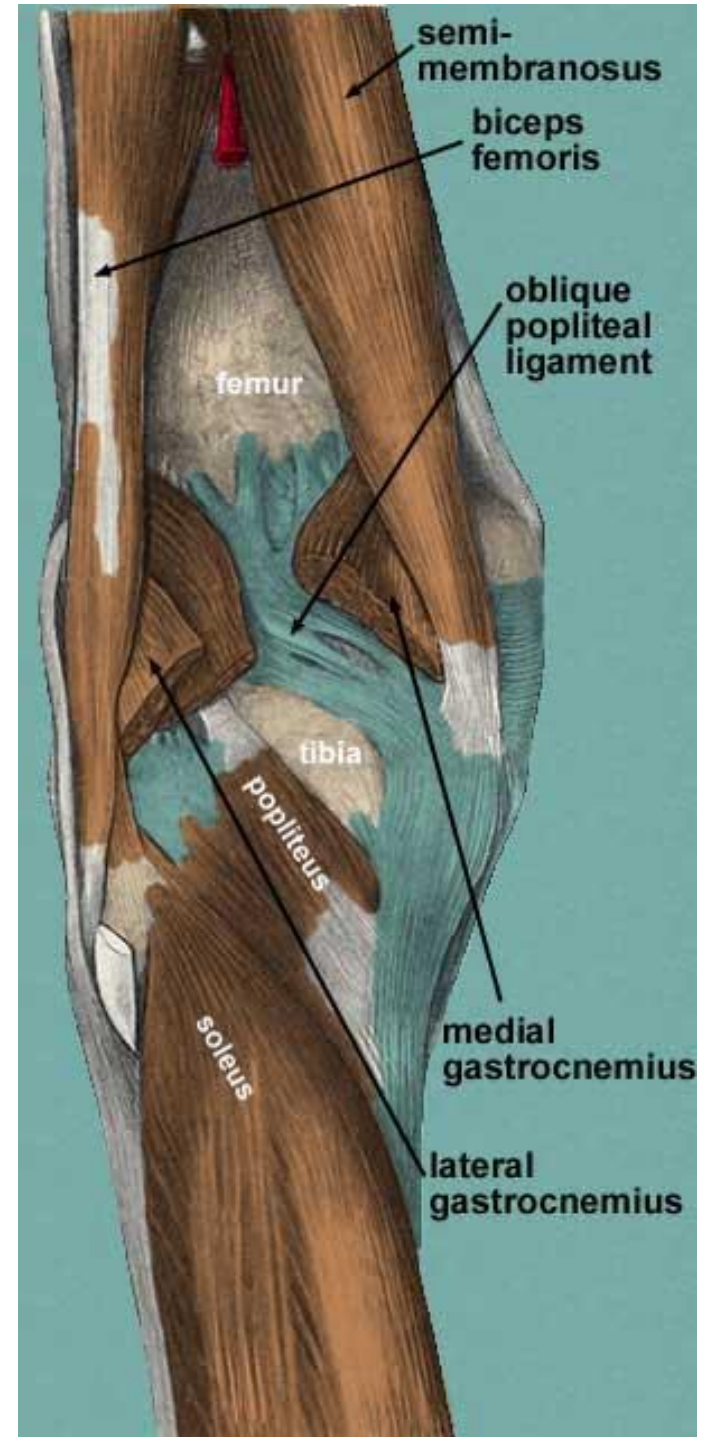


Interactive Knee 1.1 c 2000 Primal Pictures Ltd.

Popliteal Fossa

With the nerves and arteries removed and the muscles reflected, you now identify the structures making up the floor of the popliteal fossa:

- posterior surface of femur
- posterior surface of tibia
- oblique popliteal ligament
- popliteus muscle



Nerves of the Popliteal Fossa

The muscles and contents of the popliteal fossa are:

Muscles

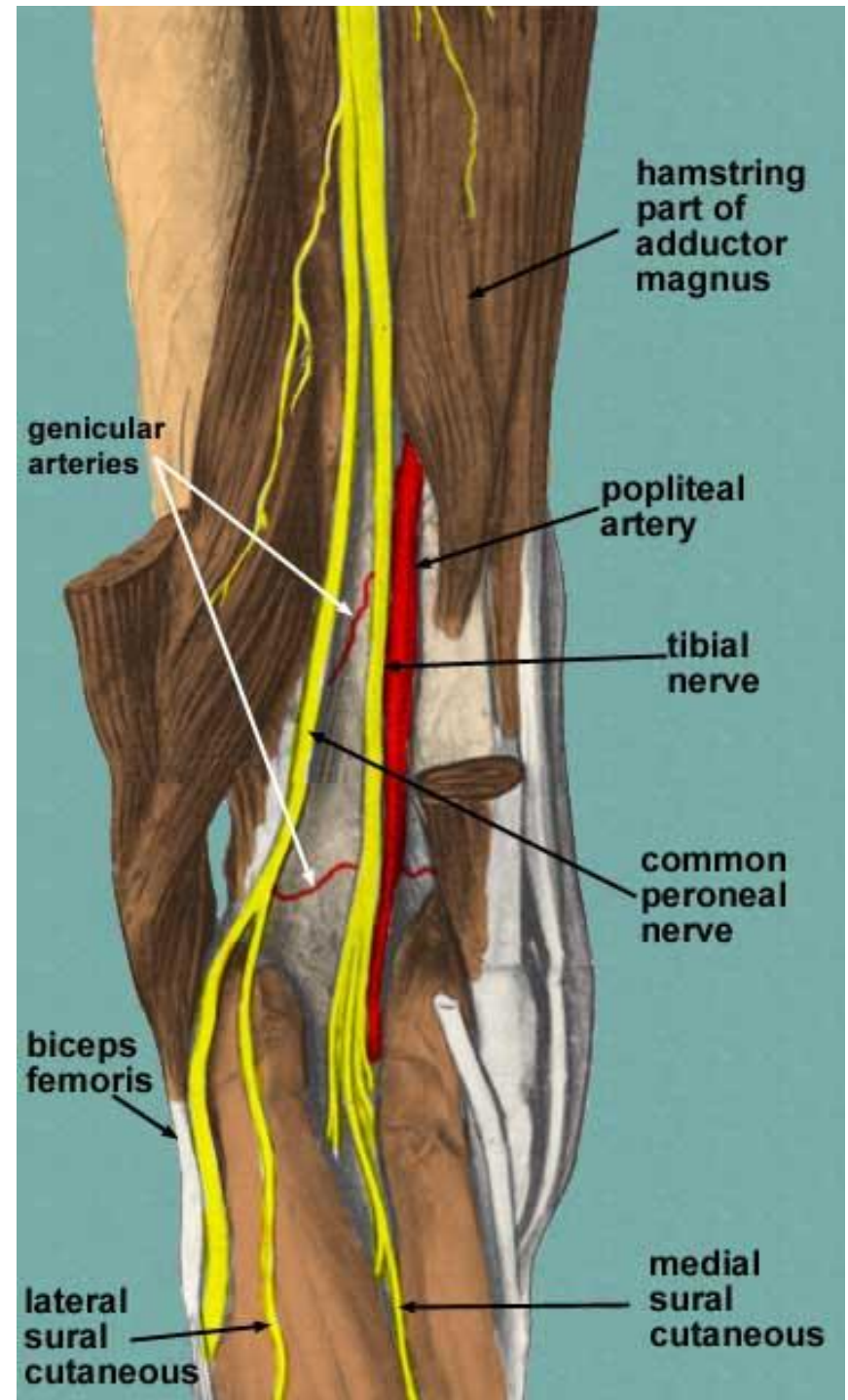
- semitendinosus
- biceps femoris
- medial head of gastrocnemius
- lateral head of gastrocnemius

Arteries

- popliteal artery - continuation of femoral artery
 - superior medial and lateral genicular arteries
 - inferior medial and lateral genicular arteries

Nerves

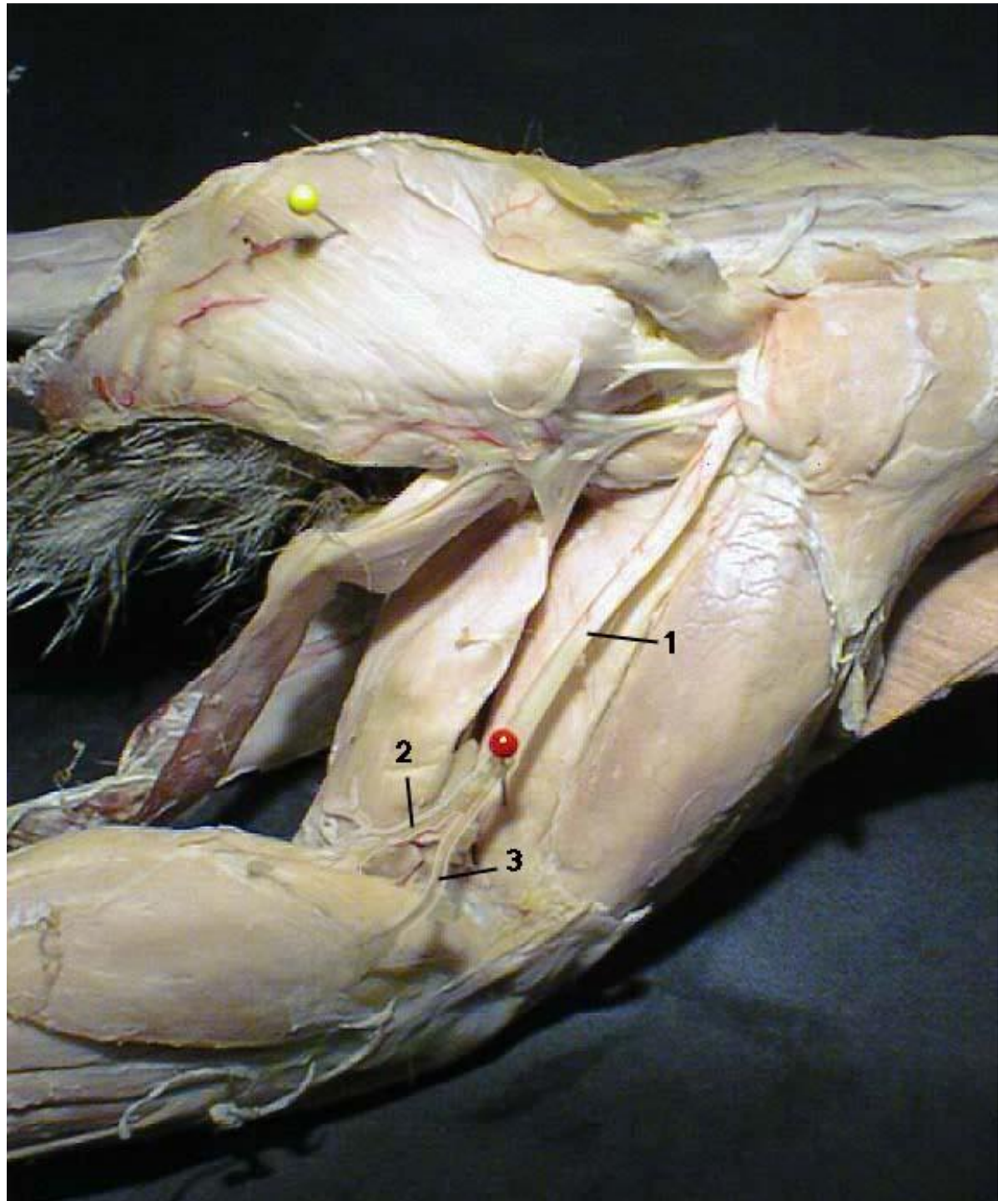
- tibial nerve
- common peroneal nerve

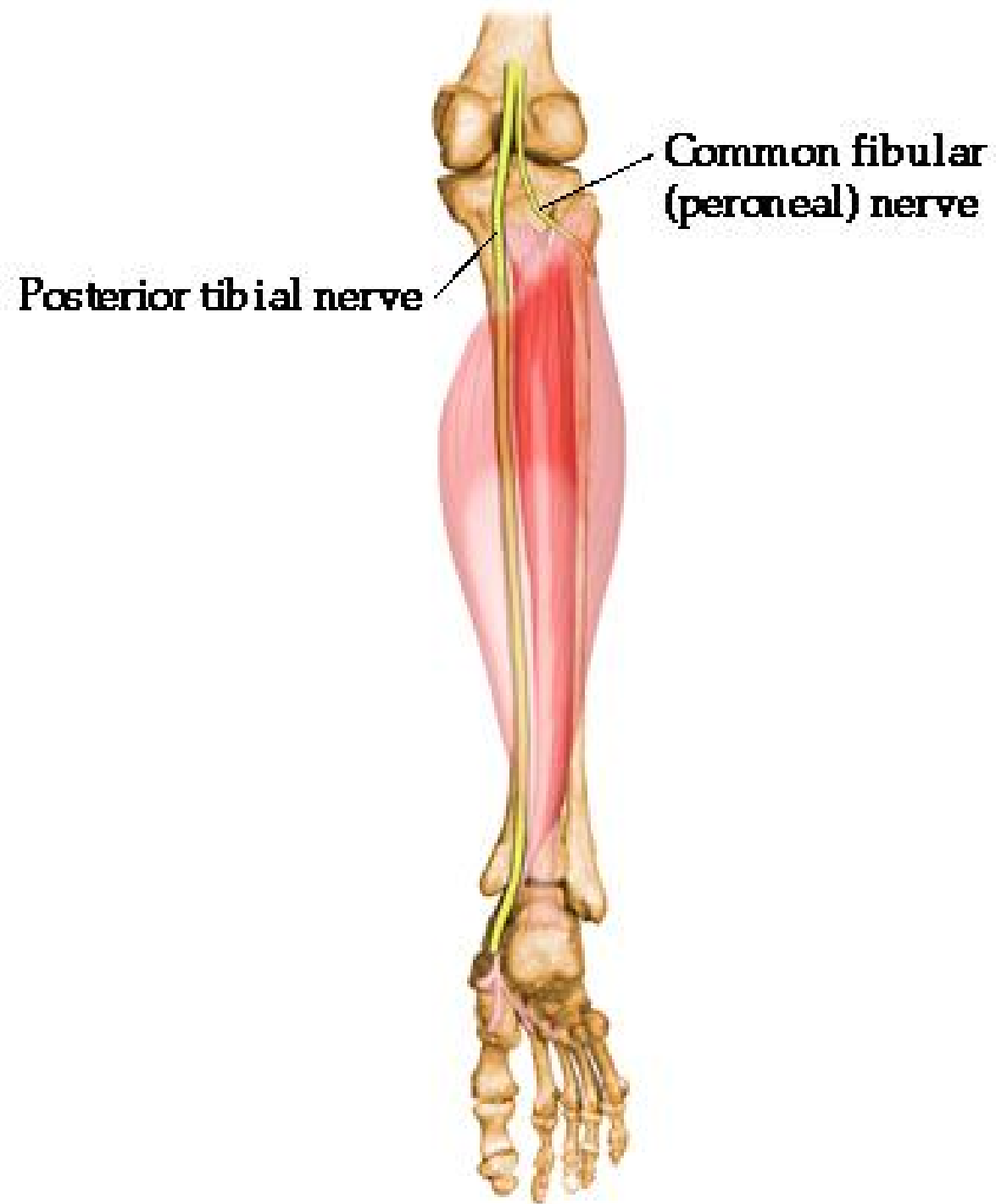


1. Sciatic Nerve

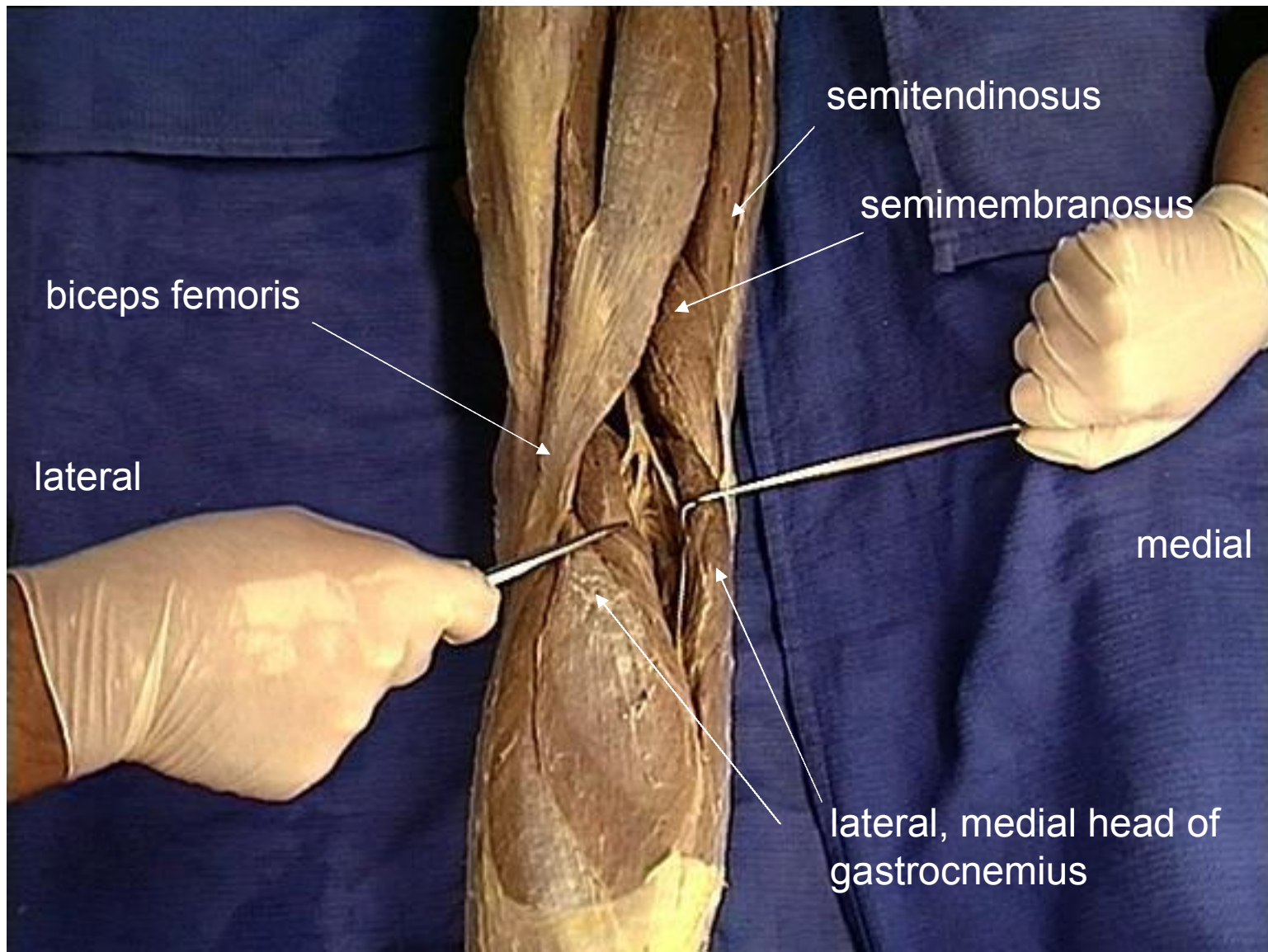
2. Tibial Nerve

3. Common Peroneal
nerve (Fibular Nerve)





Popliteal Fossa



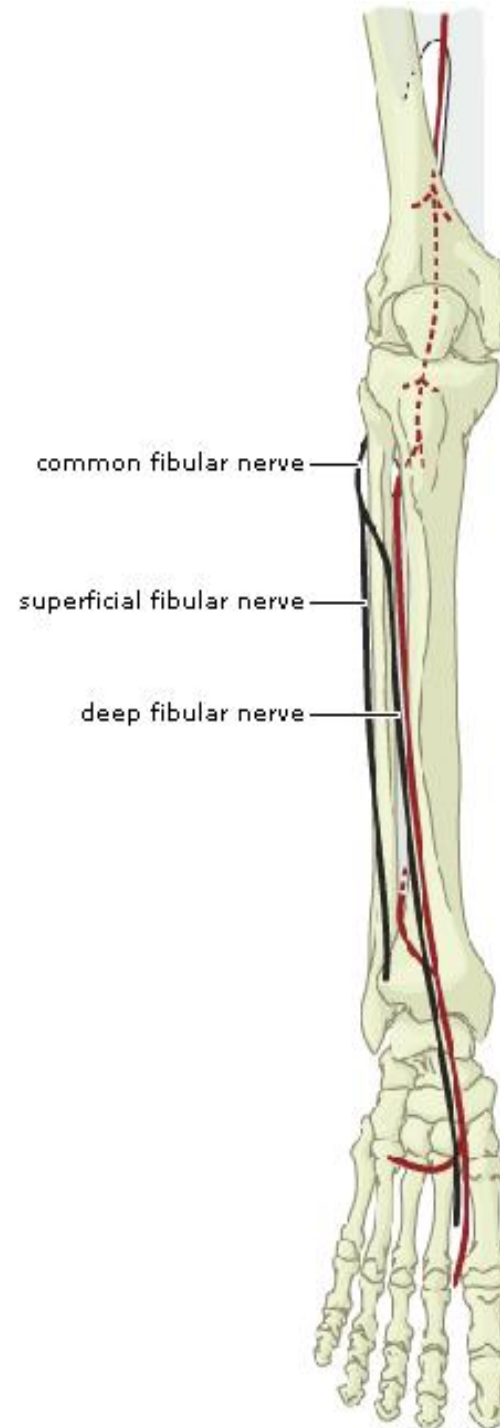
- **Common peroneal nerve**

passes superficial to the neck of the fibula, where it is subcutaneous and vulnerable to injury

- Severance of this nerve causes paralysis of all the muscles of the anterior and lateral compartments (dorsiflexors of the ankle and evertors of the foot). The loss of eversion of the foot and dorsiflexion of the ankle causes **foot-drop**.

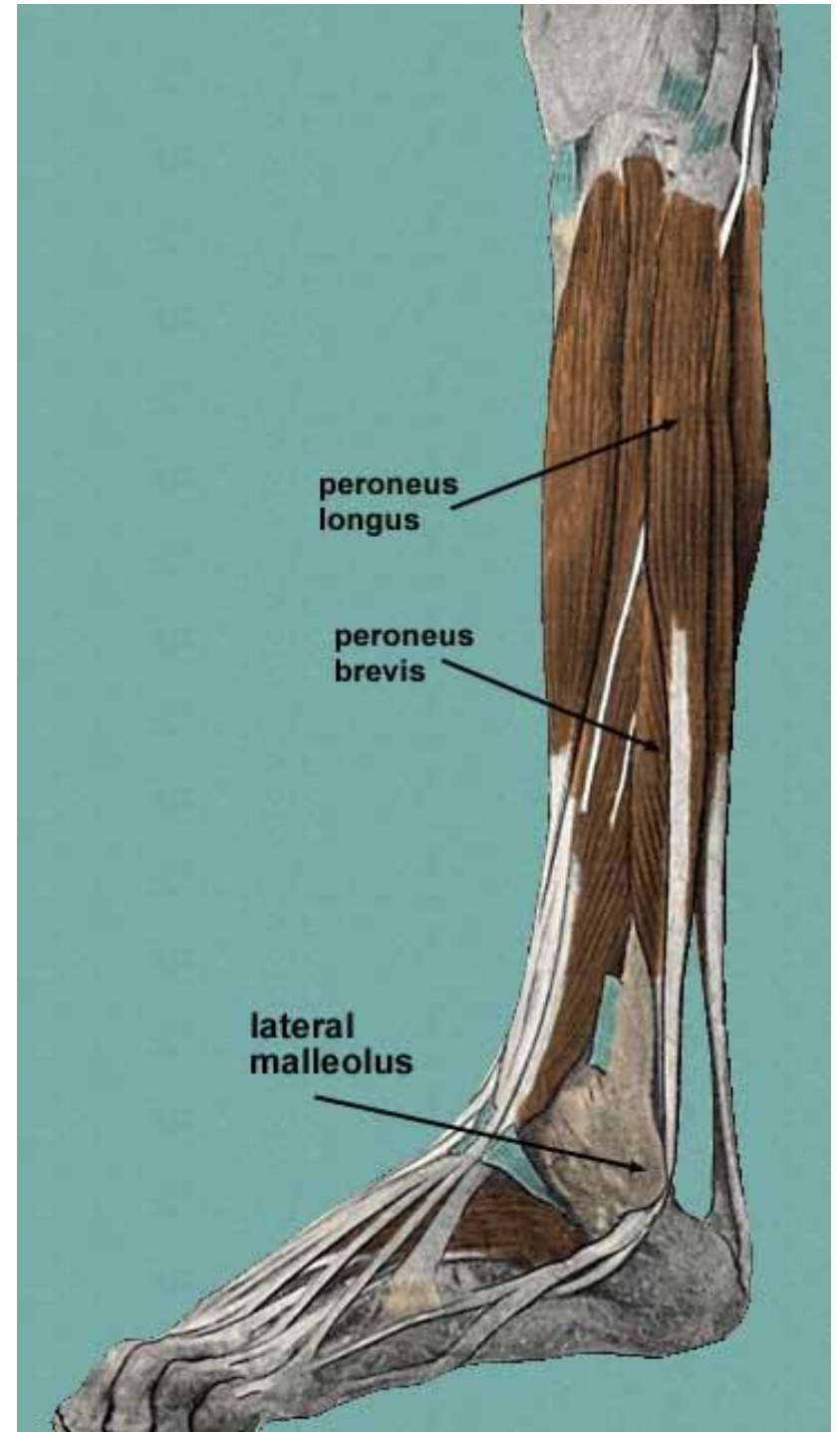
Branches:

- **Superficial peroneal nerve- lateral leg compartment-** peroneus brevis, peroneus longus
- **Deep peroneal nerve-**This is the nerve of the **anterior leg compartment**.
 - Tibialis anterior, Extensor hallucis longus, Extensor digitorum longus, Fibularis (peroneus) tertias
 - Dorsiflexion of foot, extension of toes



Lateral Compartment

- also called the peroneal compartment
- is made up of two muscles whose tendons cross the ankle joint posterior to and under the lateral malleolus. This makes them flexors of the foot. These muscles are the:
peroneus longus
peroneus brevis

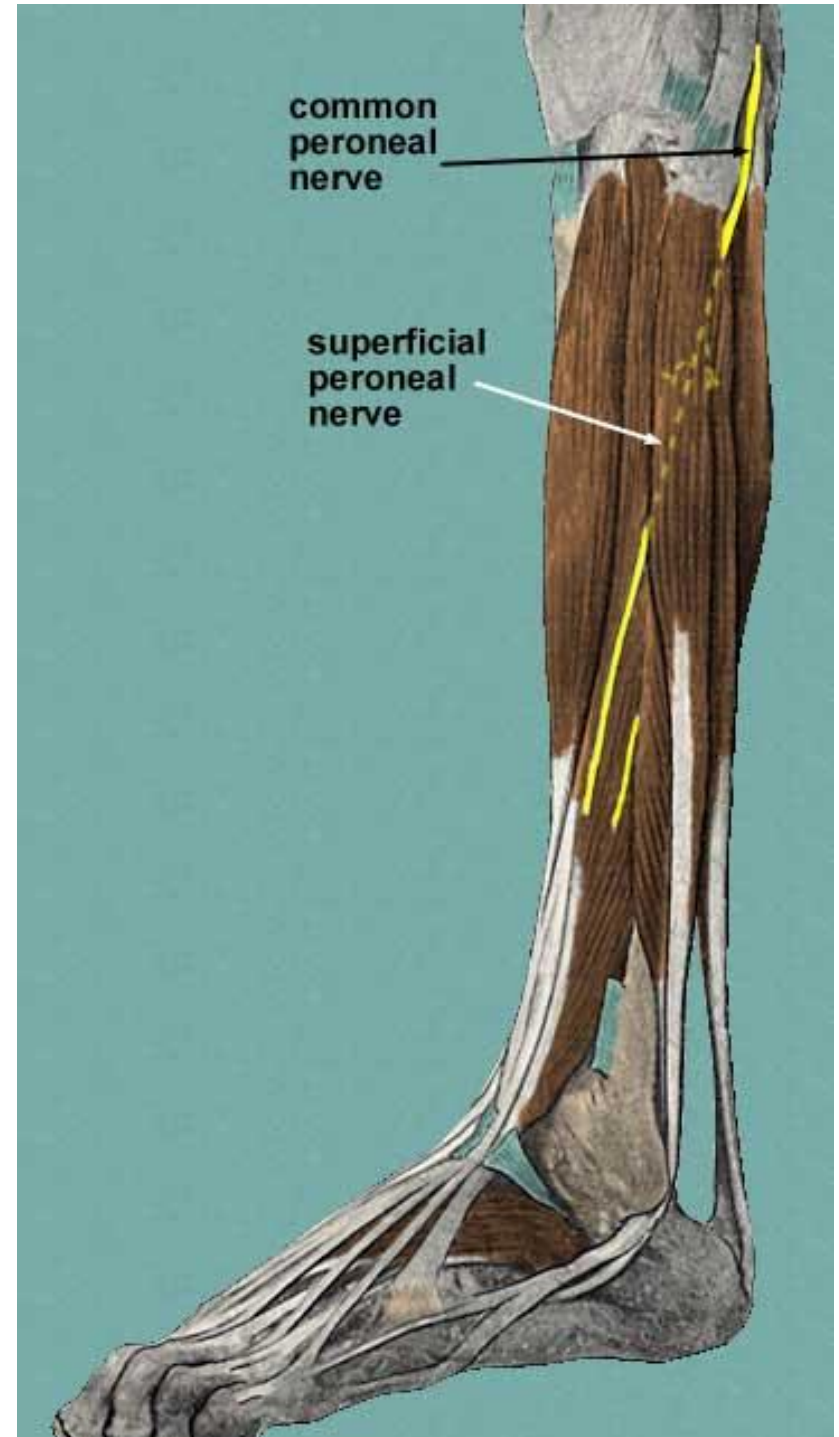


Superficial peroneal Nerve of the Lateral Compartment

The superficial peroneal nerve branches from the common peroneal nerve near the neck of the fibula and passes between the peroneus longus and brevis muscles, at which point they supply the muscles. The superficial branch then continues onto the dorsum of the foot to supply the skin there.

Arteries of the Lateral Leg

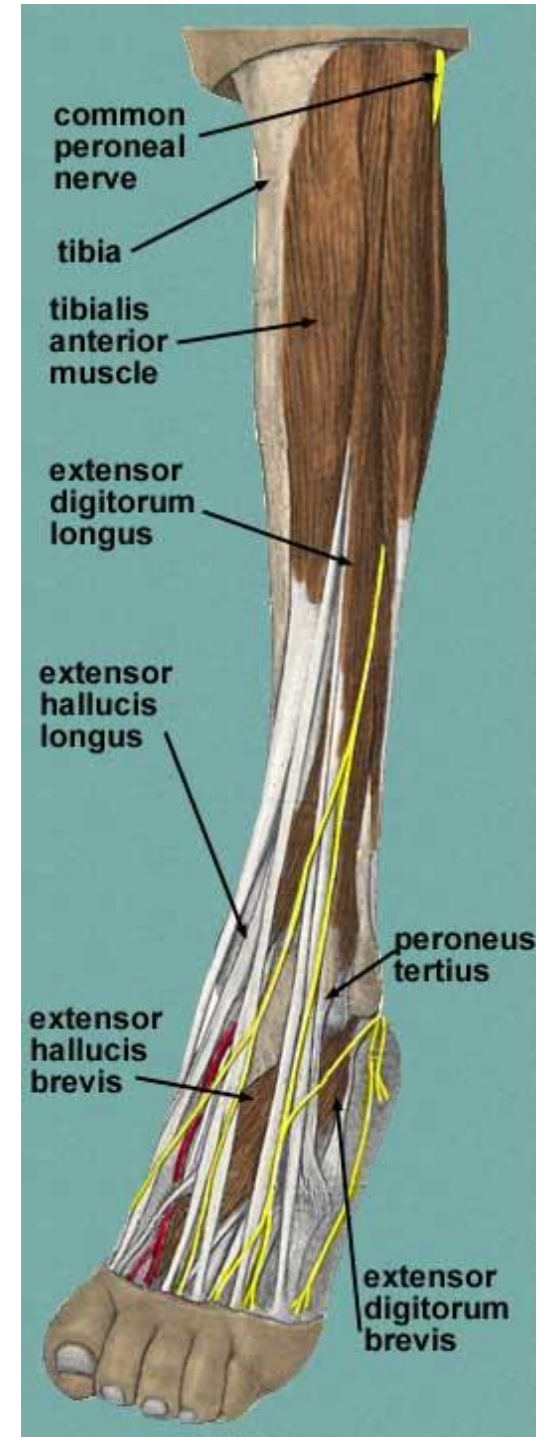
The arteries to the tissues in this region are from both the anterior and posterior tibial branches of the popliteal artery.



Anterior Leg Compartment

The anterior compartment contains muscles that are basically extensors of the ankle and toes. They include:

- tibialis anterior
- extensor digitorum longus**
- extensor hallucis longus**



Deep Peroneal Nerve of the Anterior Compartment

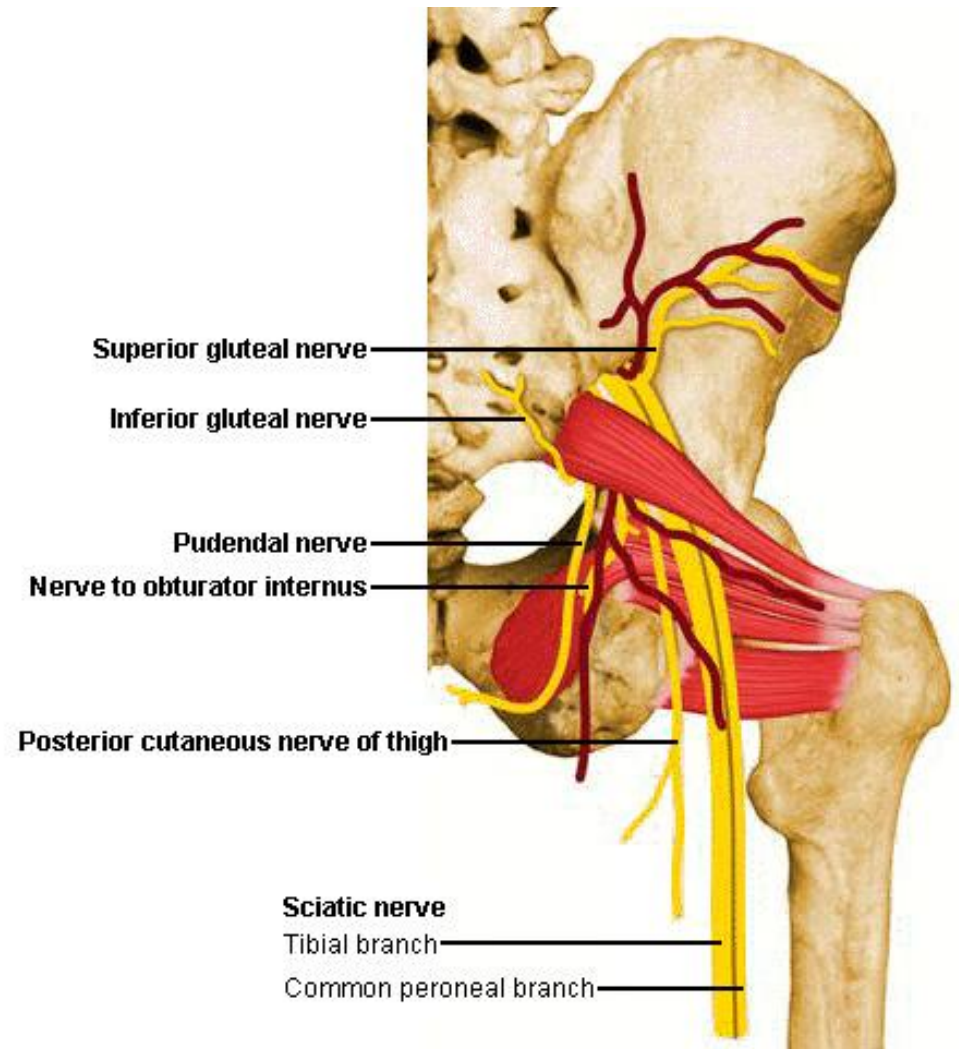
The nerve of the anterior compartment of the leg is the deep peroneal nerve. This nerve terminates between the big toe and second toe and can be tested at this point.

The artery of the anterior compartment of the leg is the anterior tibial artery which is a branch of the popliteal artery. Its terminal branch, the dorsalis pedis, can be palpated on the dorsum of the foot between the 1st and 2nd metatarsal bones.



Other Sacral Nerves: Internal Pudendal Nerve

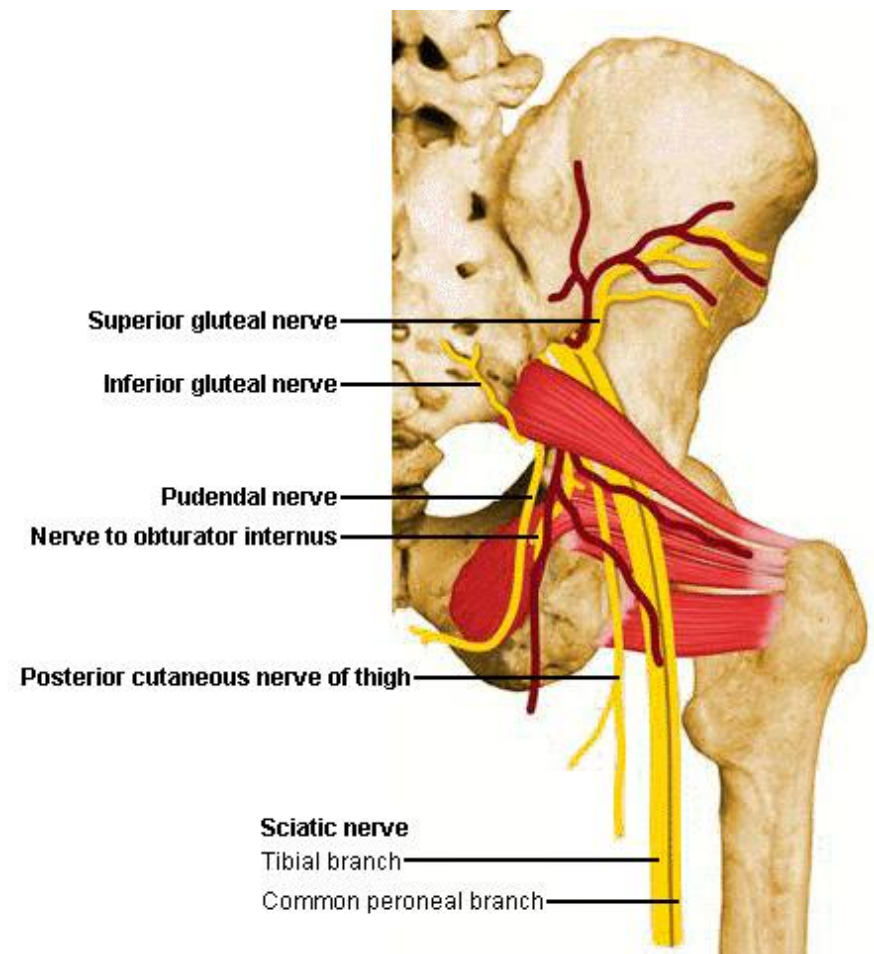
S2, S3, S4 join to form the pudendal nerve that supplies structures in the perineum.



Other Sacral Nerves:

Posterior Cutaneous Femoral Nerve

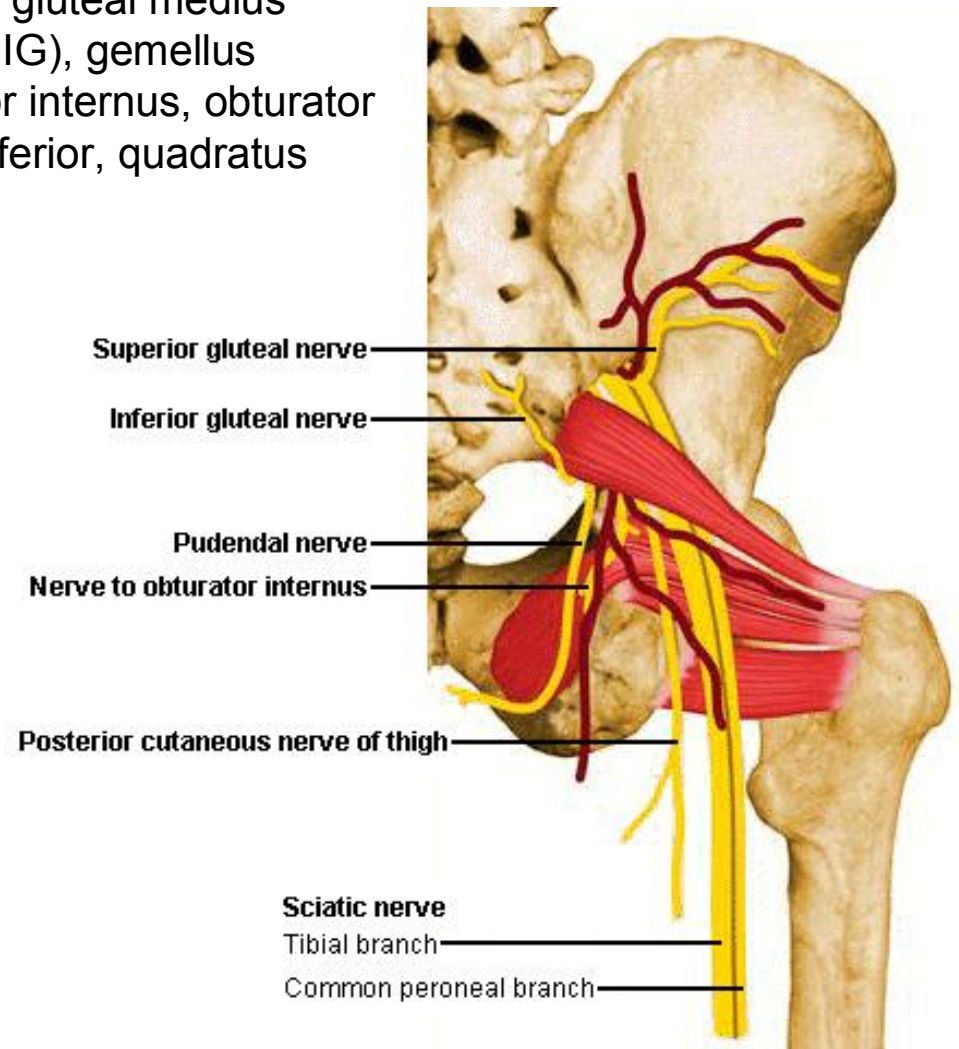
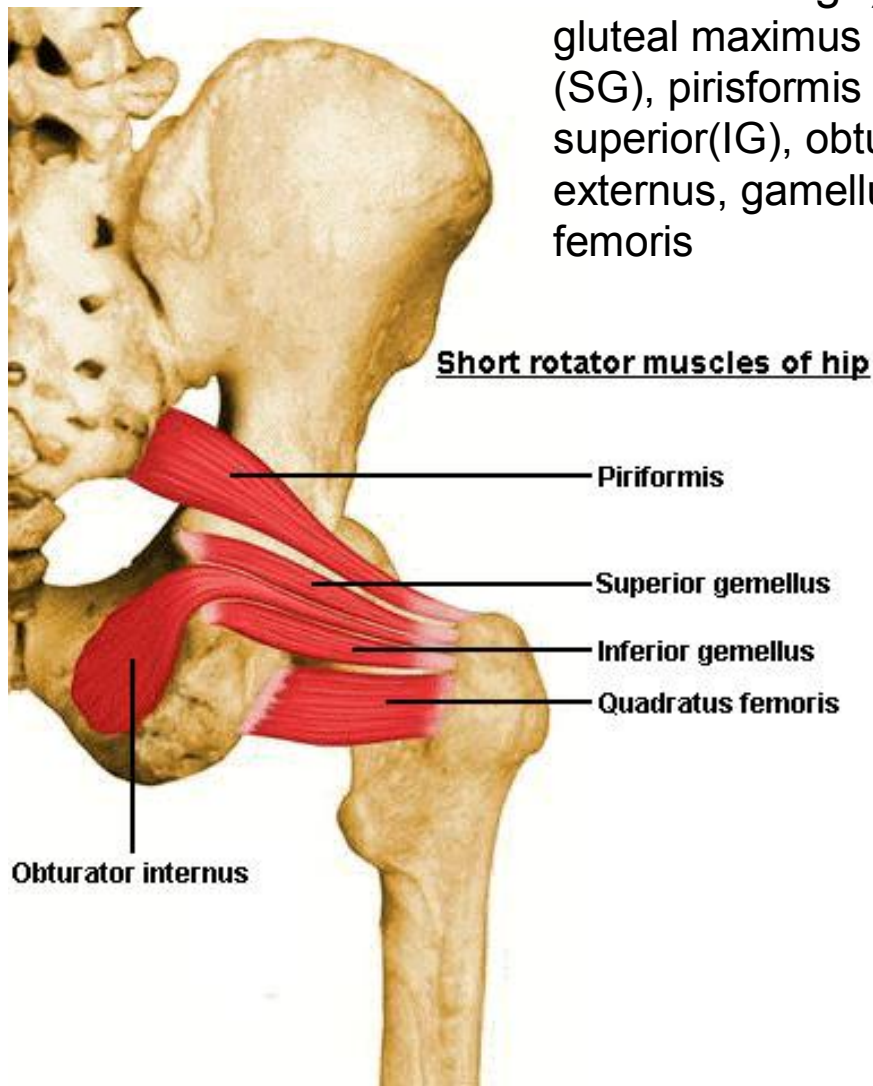
- arises from the **posterior divisions of the ventral rami of S1 and S2 and the anterior divisions of S2 and S3.**
- It supplies **more skin than any other cutaneous nerve.**
 - skin of the **inferior of the buttock**
 - skin of the **perineum.**
 - posterior thigh and proximal part of the leg.



Other Sacral Nerves:

Superior and Inferior Gluteal Nerve

Deep Gluteal Muscles (muscles that move the thigh)- Gluteus minimus (SG), gluteal maximus (IG), gluteal medius (SG), piriformis (SG,IG), gemellus superior(IG), obturator internus, obturator externus, gemellus inferior, quadratus femoris



Sciatic Nerve; Summary

Originates from L4-S3

Sciatic nerve is comprised of the tibial and common fibular nerves, running in a common epineurium

Landmark: Within the pelvis, the sciatic nerve lies immediately anterior to the piriformis

Landmark: Sciatic nerve emerges from the pelvis via the greater sciatic foramen, usually inferior to the piriformis and deep to the gluteus maximus

Motor (tibial nerve): Posterior compartment of the thigh

Exception: short head of biceps femoris is innervated by the common fibular nerve

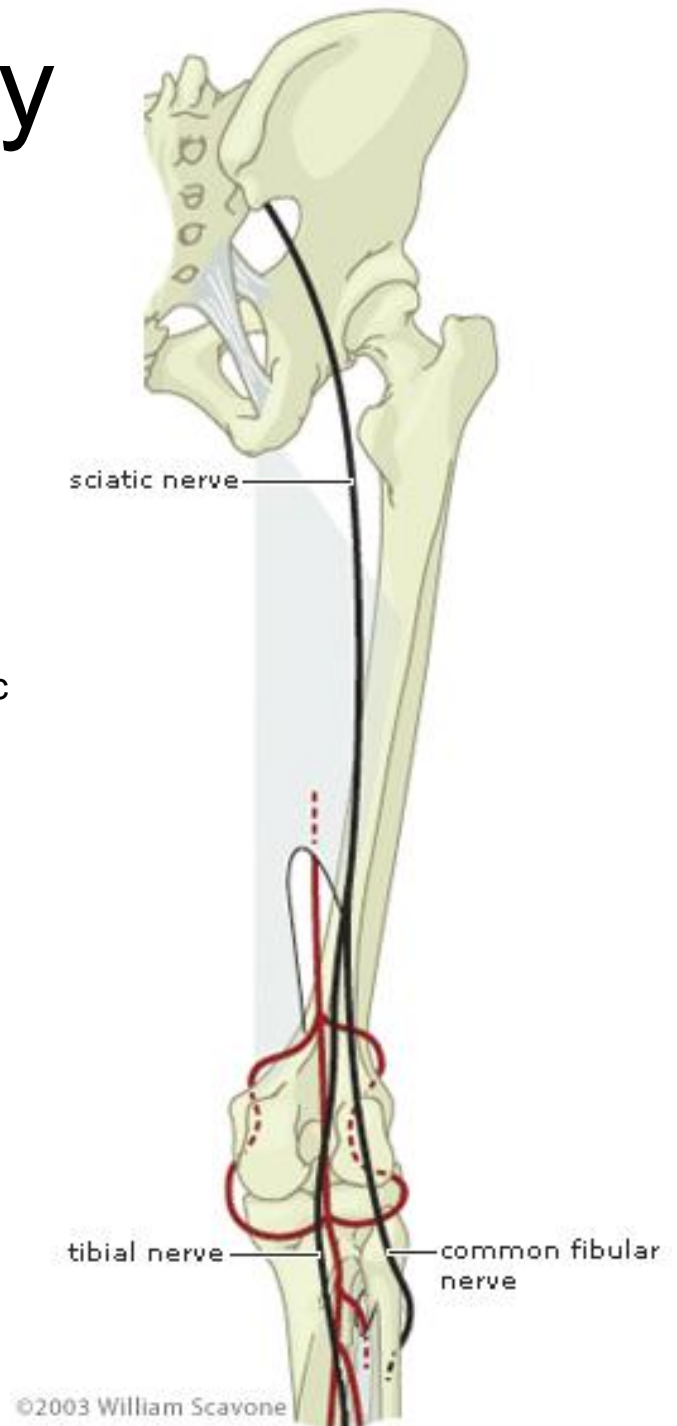
Muscles of the posterior compartment of the thigh

Action: Extend hip, flex knee

Branches: **Tibial nerve** and **common peroneal nerve**

Injury to nerve: Loss of all motor innervation to posterior thigh, anterior and posterior leg, and foot

Clinical features: "Flail foot"

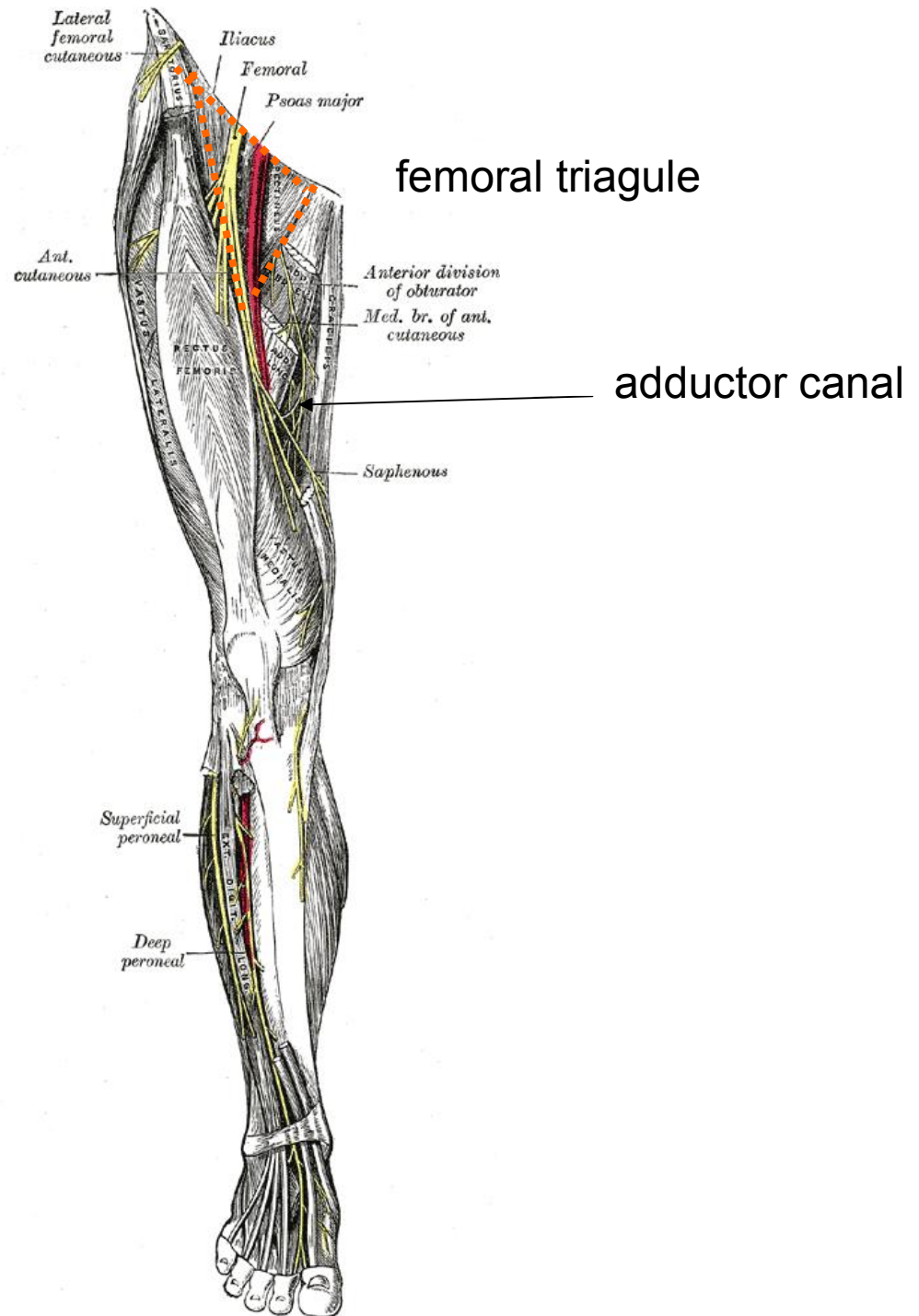


Sciatic Nerve

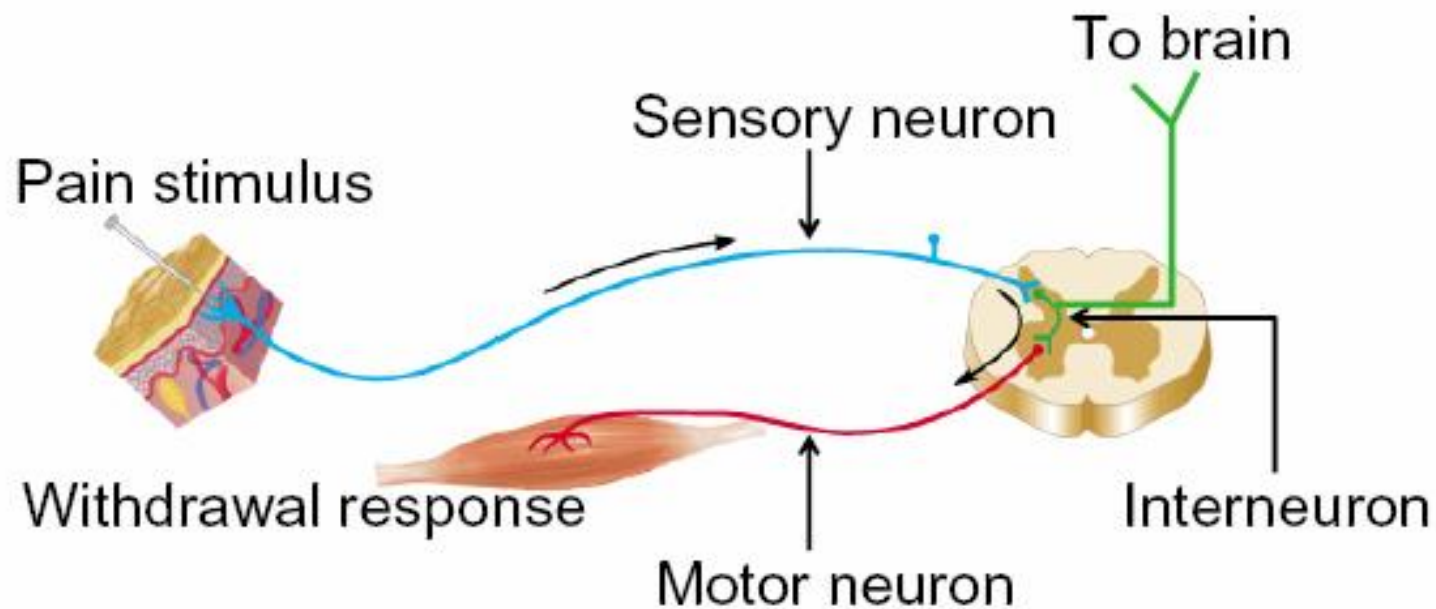
- largest nerve in the body
- made up of nerve roots from the 4th lumbar vertebra to the 3rd sacral vertebra.

•The **adductor canal** serves as a conduit through which vessels pass from the femoral triangle to the posterior aspect of the knee; **popliteal fossa**

- femoral artery, vein, and nerve
- saphenous nerve
- nerve to vastus medialis



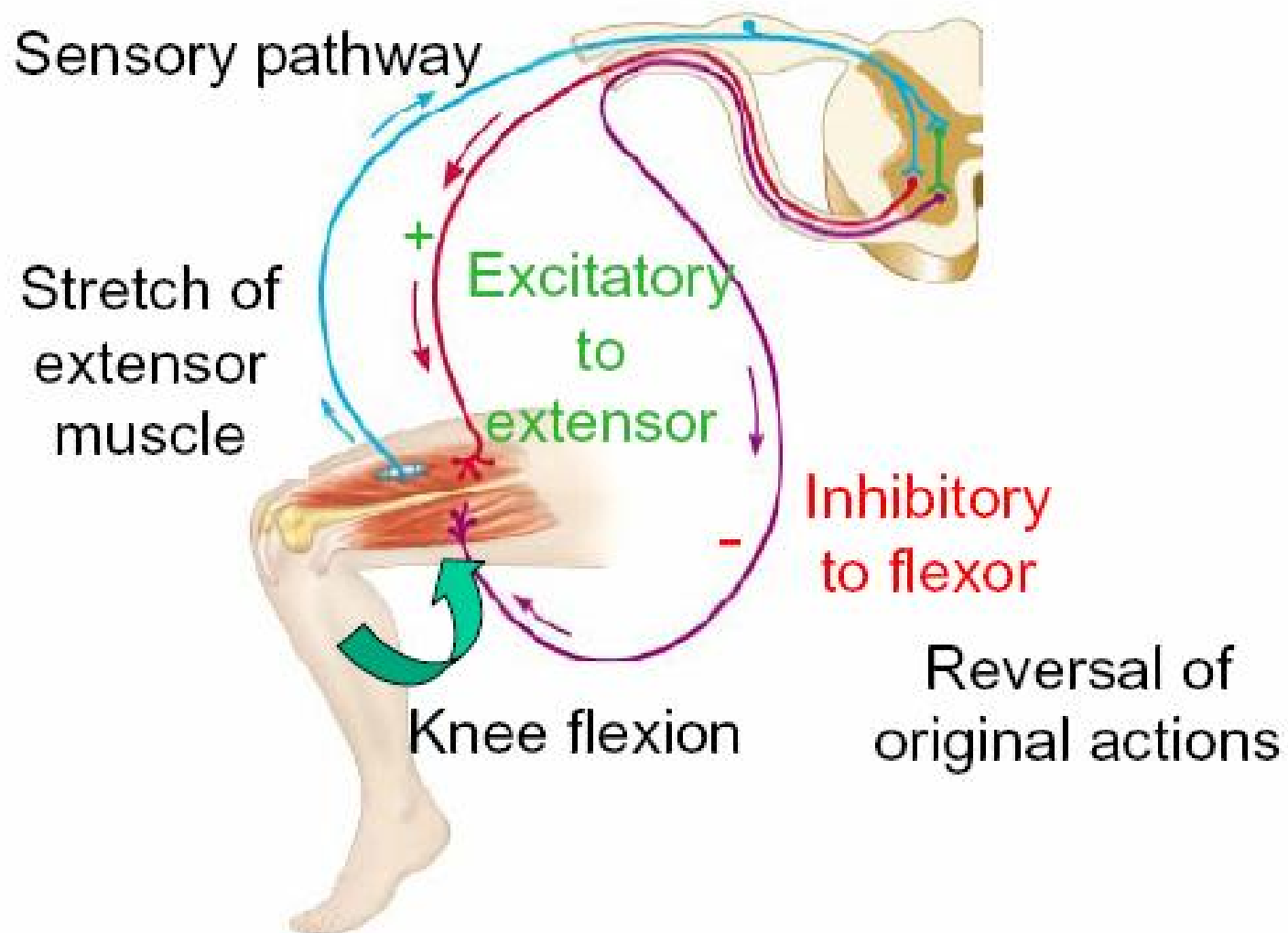
The Reflex Arc



Reflex: a direct connection between stimulus and response, which doesn't require conscious thought.

Withdrawal Reflex: avoidance of noxious stimulus; 3-neuron; flexor reflex.

Stretch Reflex



Knee-Jerk Reflex

